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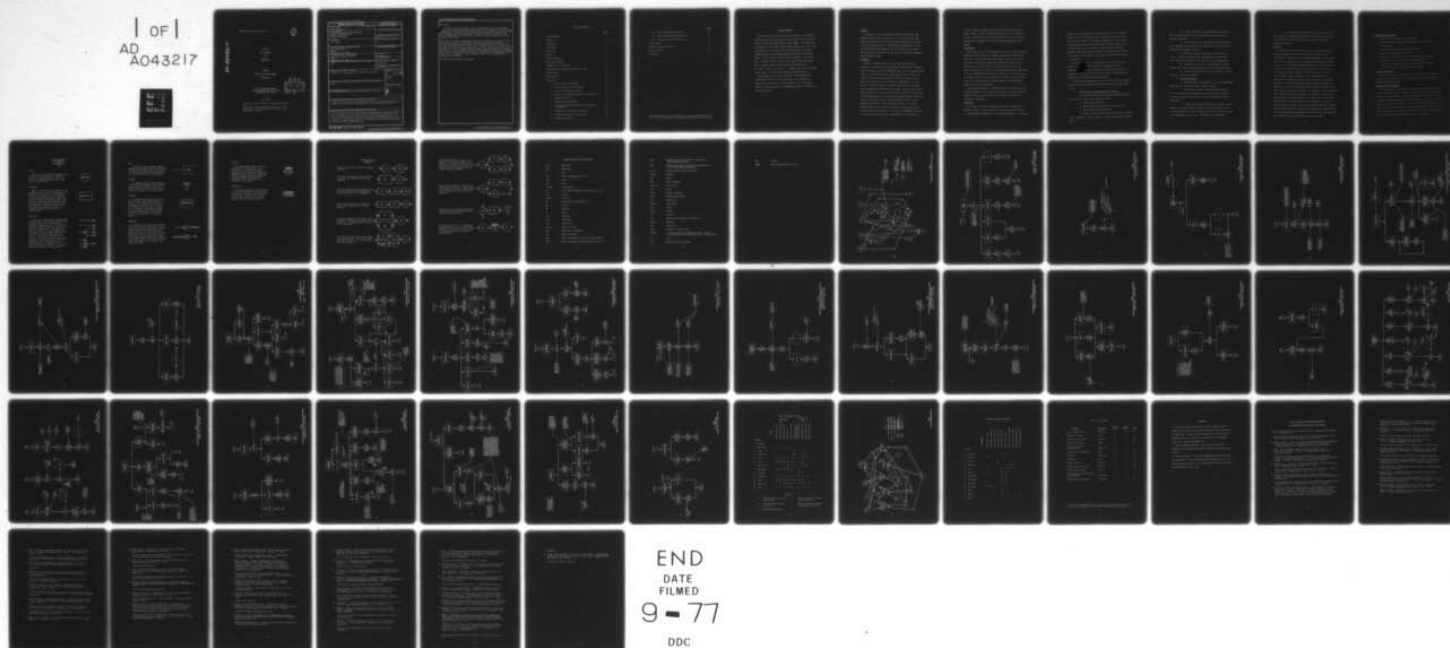
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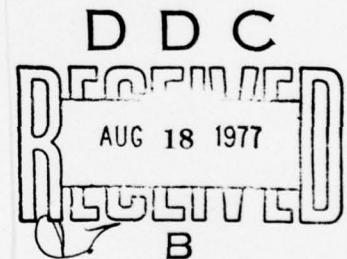
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PATIENT
APPOINTMENTS
AND
SCHEDULING

PROCESS
CONDITION-ACTION DIAGRAM
FLOWCHARTS

U.S. ARMY TRIMIS AGENCY
WALTER REED ARMY MEDICAL CENTER
WASHINGTON, DC 20012



June 1976

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| 20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The purpose of the Patient Appointments and Scheduling (PAS) System condition- action flowcharts is to present in easily understandable graphic form the major processing involved in an advanced clinic appointments system. The PAS System is intended to provide the appointing and scheduling portion of the health care support systems which are the mission of the Tri-Service Medical Information System (TRIMIS) project. | | |

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Block #20:

In the face of a wide diversity in clinic appointing operations throughout the military medical departments, the intent of this system is to be relatively comprehensive. Therefore, the TRIMIS PAS Subsystem includes features that may not be implemented at all hospitals or clinics. However, a subset of the system should suffice for any given treatment facility regardless of specialization or work load.

The essence of patient appointments and clinic scheduling as embodied in PAS is to bring together at a specified time and place the three essential elements for a patient-CP encounter - the patient himself, the care provider CP, and the medical record or "data base." Further, this is to be done in such a manner as to aid the clinic chief and unit manager in efficiently managing the clinic, to help in keeping medical records available where and when needed, and to aid the patient and care provider in planning their individual schedules. While this is conceptually rather straight-forward, it is pragmatically actually quite complex.

An annotated bibliography is included.

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*These mnemonics are not intended for use as general identifiers, but are used in these charts for indexing and cross-referencing purposes.

ACKNOWLEDGEMENTS

These charts were developed by Mr. Karl Schank of the TRIMIS-Army Agency, who also did the initial analysis of the then-existing system at Walter Reed Army Medical Center (WRAMC). The design and development of the complete system charted herein was a joint effort participated in by the Army, Navy, and Air Force with technical assistance from a Systems Engineering and Integration Contractor (SE&I). The principal military personnel involved in this effort were: CWO John C. Morris and Mr. Karl Schank, TRIMIS-Army Agency; Mrs. R. Lynne Nearman, Naval Medical Data Services Center; CPT John J. Cleary, Jr. and Mr. J. T. Wright, Air Force Data Systems Design Center. The SE&I was IBM Federal Systems Division.

Many thanks to Mrs. Margot Alessandro of the WRAMC Central Appointments Section, as well as her staff, who allowed us to analyze her system and put up with us when we did. LTC Norman Wallace and MAJ Carl Helser of the WRAMC Department of Clinics also deserve our thanks.

PURPOSE.

The purpose of the Patient Appointments and Scheduling (PAS) System condition-action flowcharts is to present in easily understandable graphic form the major processing involved in an advanced clinic appointments system. The PAS System is intended to provide the appointing and scheduling portion of the health care support systems which are the mission of the Tri-Service Medical Information System (TRIMIS) project.

BACKGROUND.

There is a wide diversity in clinic appointing operations throughout the military medical departments, ranging from individual clinic maintenance of local appointment books, to block-scheduled mass clinics, to individual patients seeing specific care providers in clinics that may be appointed either centrally or locally. The intent of the system is to be relatively comprehensive. As such, it must be flexible enough to be usable for facilities that have a single Centralized Appointment Section (CAS), as well as facilities that in addition to or in lieu of this have a system of decentralized local appointing areas (the clinics) operating throughout the medical facility or region. Further, the system must be usable by MTFs ranging from the small stand-alone medical clinic to the large military medical center with a wide variety of specialty services and/or active teaching program. Therefore, the TRIMIS PAS Subsystem includes features that may not be implemented at all hospitals or

clinics. However, a subset of the system should suffice for any given treatment facility regardless of specialization or workload. In fact, a major portion of the features charted here have recently been manually implemented at the Walter Reed Army Medical Center (WRAMC).

LIMITATIONS.

The reader must not at this time expect to find a hospital Central Appointment Section (CAS), for example, in which the clerks follow exactly all the procedures described herein. This is because the PAS System charted here includes more capabilities than, and is a superset of, any known system at the time of this writing. The system presented here is, in fact, a technology-independent description of the full TRIMIS PAS System design. However, the internal details of routine processes such as production of reports are not presented here, as the condition-action diagram format is an inappropriate medium for that type description.

Although the maintenance of operating room (OR) schedules is one required component of the subsystem that has not yet been adequately addressed, and is not charted here, work has been initiated to complete its definition.

OBJECTIVES.

The essence of patient appointments and clinic scheduling as embodied in PAS is to bring together at a specified time and place the three essential elements for a patient-CP encounter -- the patient

himself, the care provider CP, and the medical record or "database." Further, this is to be done in such a manner as to aid the clinic chief and unit manager in efficiently managing the clinic, to help in keeping medical records available where and when needed, and to aid the patient and care provider in planning their individual schedules. While this seems at first to be rather straight-forward, it is actually quite complex and requires a good deal of processing to accomplish.

These PAS processes are visualized as the starting point for patient care encounters and health care management, and it is understood that this initial contact often determines the patient's perception of the entire facility and its staff. Consequently the patient must be treated with tact and respect.

More specific philosophies, policies, and objectives are outlined under the following headings that indicate the major process groups of PAS.

a. Care Provider Schedule Maintenance Function.

1. Satisfy or match patients' unique appointment criteria and desires with clinic/care provider schedules.
2. Reduce waiting room time.
3. Reduce patient waiting time for an appointment.
4. Reduce appointment making time.
5. Speedily and efficiently provide the means to schedule, locate, summarize, confirm, change, or cancel an individual's appointments.

6. Provide the means to satisfy those patient appointment requirements when clinic or care provider schedules are not currently available.

7. Allow flexibility of scheduling so that appointments can be made for the individual care provider from the clinic and/or the Central Appointments Section.

8. Reduce and resolve appointment conflicts arising from an attempt to create multiple appointments at the same time (in an integrated environment this may involve other subsystems).

9. Insure that in no case is an appointment ever made automatically for an outpatient without her/his active concurrence.

10. Allow for the appointing of every encounter a patient has with a clinic/care provider.

c. Follow-Up Function.

1. Remind patients of confirmed or cancelled appointments (this must not abridge his right to medical privacy).

2. Provide daily lists of scheduled appointments for each clinic session in sufficient time to arrange their delivery to the clinic and practitioner prior to the first scheduled patient's appointment.

3. Provide lists to notify the medical or dental record room and x-ray image library personnel of records required by the clinics in sufficient time to arrange delivery of the patient records to the appropriate clinic prior to the patient's appointment.

4. Provide an accurate method of patient accounting and improved data on the demand for health care services for the clinics or care provider (these statistics may be used as a variety of management reports).

OVERVIEW.

The PAS System is an advanced outpatient appointments system capable of supporting with great flexibility the specialized requirements of subspecialty clinics, and individual care providers practicing in clinics, as well as traditional block-appointed mass clinics. It is a blended centralized/decentralized system offering a significant degree of local clinic control, and local as well as CAS appointing. Hence, nowhere is any distinction, or even any mention, made of CAS as opposed to clinic-located appointing. Facilities are included to handle many of the problems of teaching hospitals, such as the professional staff rotating throughout the hospital. As with any appointments system, medical records delivery to the clinic prior to the appointment is supported. Useful managerial and statistical reports are provided; and because the facilities to handle short lead time appointments and walk-ins are included, workload data may be collected uniformly and completely. In order to reduce no-shows, reminder notices can be mailed to patients. The PAS System charted here offers significant flexibility and capability in care provider schedule maintenance, patient appointing, and follow-up and reporting that may be unavailable with most systems.

EXPECTED BENEFITS INCLUDE:

- o Improved local control and responsiveness.
- o Single centralized appointment and schedule data base, if ADP supported.
- o Uniform and complete workload data collection.
- o Greater flexibility and capability.
- o Greater clerk knowledge of clinic operations and procedures.
- o Automatic record retrieval and roster generation.
- o Improved utilization of professional and physical resources.
- o Improved patient and professional satisfaction.

SUBSYSTEM INTERFACES

As noted, there are major interfaces to the clinics (W/C) system, and the Patient Administration (PAD) System particularly including the PAD Medical Records Library.

AMENABILITY TO ADP SUPPORT.

The eventual goal is that PAS be an automated system with significant on-line interactive computer support. However, in these flowcharts, the processing is presented only in terms of procedures. Because of this technology-independent approach, the system and the charts are not in any way tied to the use of a computer or any other technology (such as lazy-susan wheels for schedule files), thus enhancing their usefulness. In fact, if workload and resources allow, any or all features of PAS may well be implemented manually by simply following the flowcharts.

CONDITION-ACTION
DIAGRAM
INTERPRETATION
GUIDE

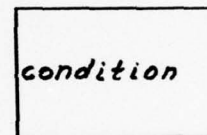
ACTION

When an action circle is encountered, the specified action, procedure, function, or process is to be performed as noted. An action is performed and never has a truth (true or false) value.



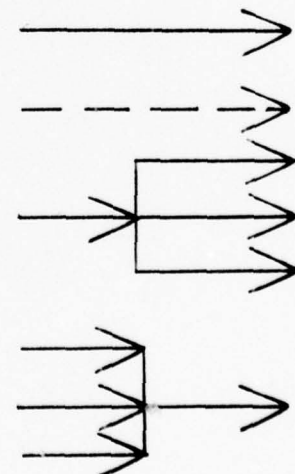
CONDITION

When a condition box is encountered, the specified condition is to be evaluated. If it holds true or succeeds, the following blocks on the diagram are to be executed. If the condition does not hold, then flow along this path of the diagram stops. The flow may, as appropriate, either be permanently blocked or may merely wait at the box pending the successful evaluation of the condition at some later time. A condition always has a truth (true or false) value.



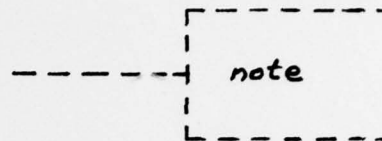
FLOWLINES

Flow proceeds through the diagram along the flowlines. When a flowline splits into multiple lines, all the lines must be followed (perhaps at once). If only one is intended, condition boxes will be used to select the proper line. When flowlines join or reconsolidate into a single line, that line is to be followed regardless of the number of joining lines that were active. Thus there is no waiting at a junction. Control, execution, or interpretation of the diagram is shown by solid flowlines. Data and information, is usually assumed to accompany control, but where necessary for clarity, it is shown, regardless of media, by dashed lines.



NOTE

Clarifying notes, comments, remarks, and other annotation, including references to additional documentation, are enclosed in dashed note boxes and are connected to the annotated structure by dashed lines.



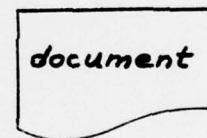
STORAGE

A triangular storage block indicates storage of information or data regardless of the medium of storage. Thus, only dashed data flow lines, not solid control lines, will connect to storage blocks.



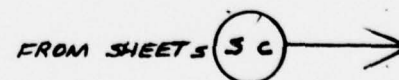
DOCUMENT

A document symbol represents information or data, regardless of media (it may or may not physically reside on a document). It is used only for clarity, as information such as that contained in the "document" is assumed to always be present along with the control flow. Like the storage symbol, only dashed data lines may connect to a document symbol.



CONNECTOR

A connector circle specifies that the flow continues on another page. An out-connector contains a number, which is the sheet number at which the flow is continued, and a letter, which specifies which in-connector on that sheet is being referenced. The in-connector contains the matching number-letter code. Adjacent to the connectors is a notation as to the sheet and process to or from which the connectors refer.



PROCESS

A striped process circle indicates a process to be performed. It is analagous to a high-level or meta-action. The process referenced will be diagrammed in its own set of condition-action flowcharts which are included in the same packet of flowcharts for reference. After the process is performed, flow resumes.



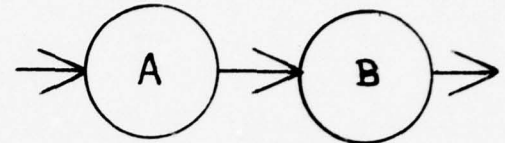
TERMINATOR

The oblong terminator symbol indicates that the current process or sub-process is complete. Normally, upon completion of a process, control returns to the process which invoked it, and resumes where it left off in that process.

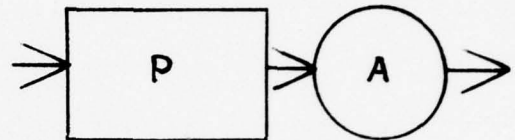


CONDITION-ACTION EXAMPLES

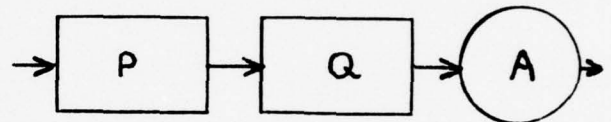
Perform Action A first, then in sequence, perform B.



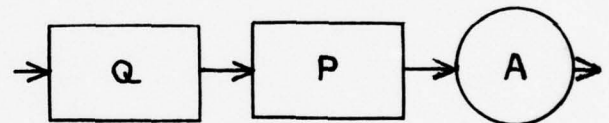
If condition P holds true, then perform Action A. If P does not hold, do not perform A.



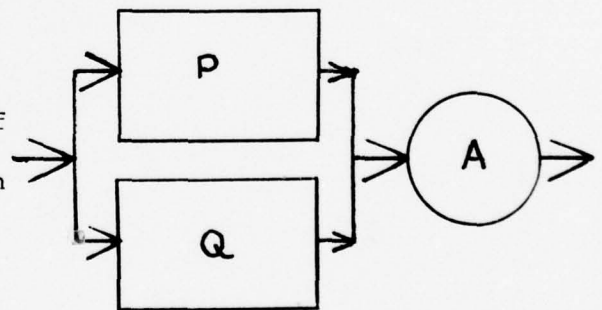
If both condition P and condition Q hold true, then perform A. If either one does not hold, then do not perform A.



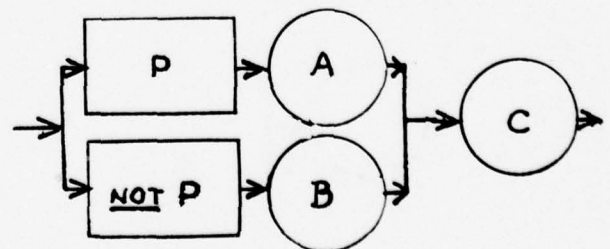
Same function and same net results as above, but evaluated in a different sequence.



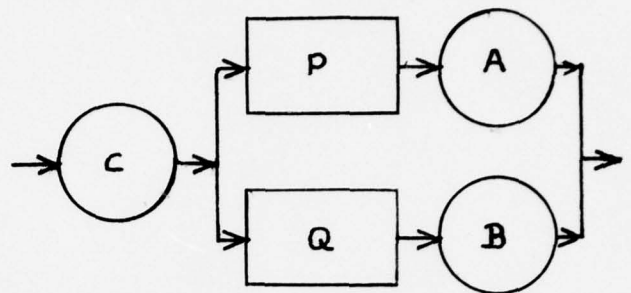
If either condition P holds true, or if condition Q holds true (or both), then perform A. If neither holds true, then do not perform A.



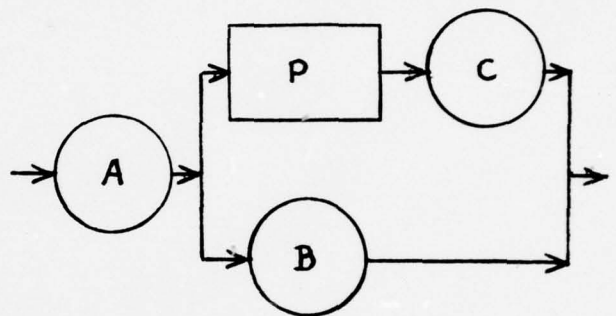
If condition P holds true, then perform Action A but not B. If P does not hold, then perform B but not A. In any case, when done, perform C.



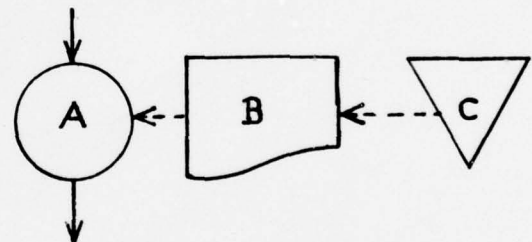
First perform Action C. Then: If condition P holds true, then perform Action A. If condition Q holds true, then perform action B. Note that both P and Q may hold, in which case both A and B will be performed.



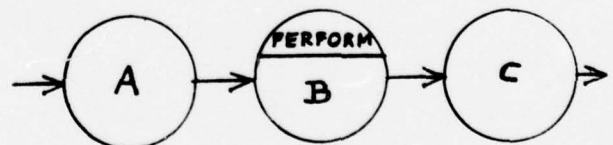
First perform Action A, then (in all cases) perform Action B. Additionally, if condition P holds true, then perform Action C (perhaps at the same time as Action B).



Perform Action A utilizing information contained on the document B which was retrieved from the file C.



First perform Action A. Then perform process B, which is itself flowcharted elsewhere in this set of charts. After B is completed, return to here and perform Action C.



ABBREVIATIONS USED IN PAS CHARTS

| | |
|----------------|---|
| add'l | additional |
| appt | appointment |
| \overline{c} | with |
| CAS | Central Appointments Section |
| clin | clinic |
| clk | clerk |
| corresp | correspondence |
| CP | Care Provider (physician, dentist, nurse, etc.) |
| curr | current |
| determ | determine |
| DF | Disposition Form, DA Form 2496 |
| doc | document |
| Dx | Diagnosis |
| Hx | History |
| incl | including |
| info | information |
| lim | limitations |
| med rec | medical record(s) |
| mgt | management or managerial |
| MR | Medical Record(s) |
| MTF | Medical Treatment Facility (hospital, roughly) |
| MTRC | Medical Treatment Record Card (patient ID card) |

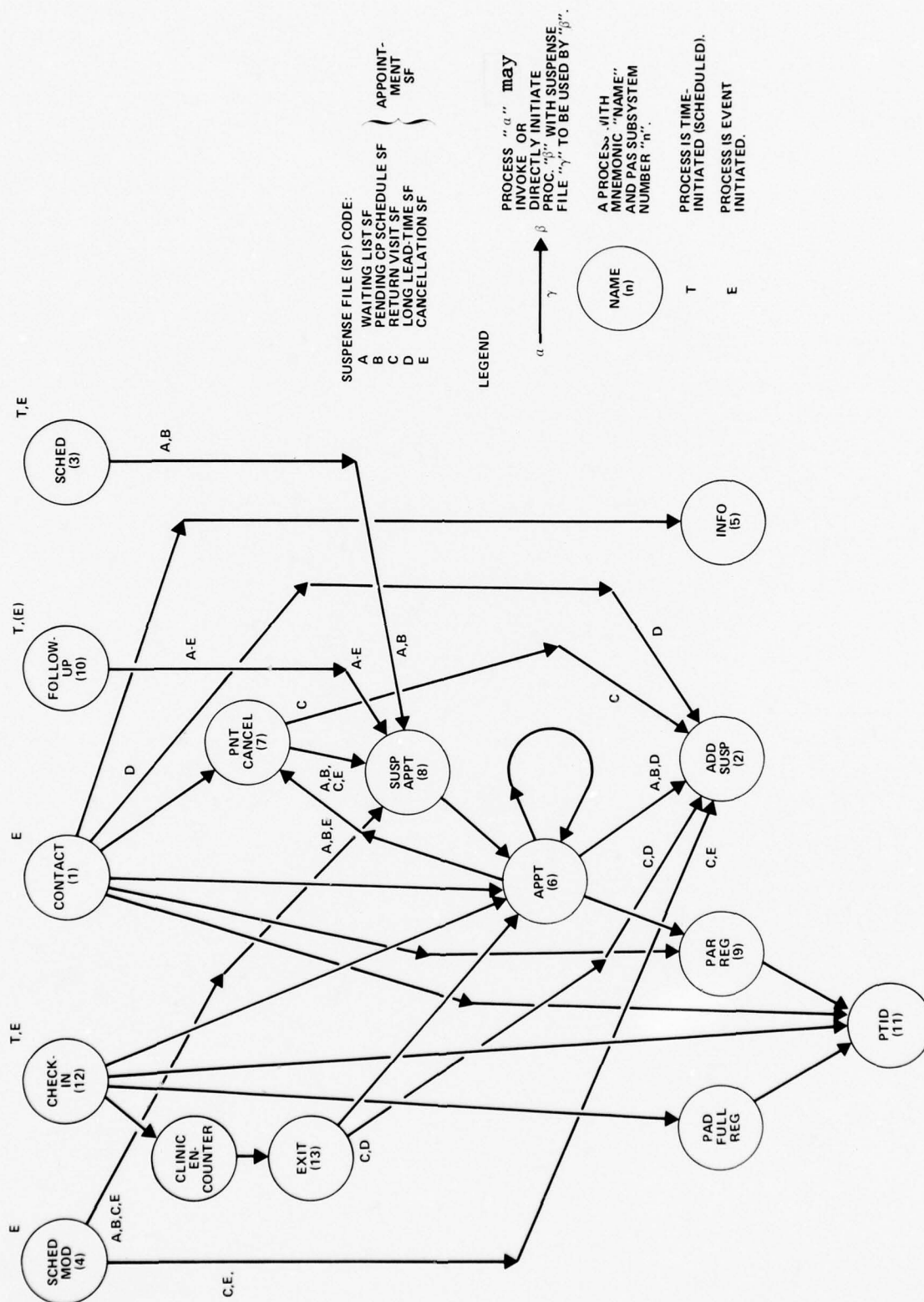
| | |
|----------|--|
| PAD | Patient Administration Subsystem (or Patient Administration Division) |
| PAS | Patient Appointments and Scheduling Subsystem (or Patient Appointments Subsystem) |
| pblm | problem (patient's medical problem) |
| persnl | personnel |
| pnt | patient |
| POC | Point of Contact |
| pri care | primary care |
| proc | process |
| prod | product or produce |
| PTID | Patient Identification |
| reg | registration |
| registr | registration |
| rept | report |
| sched | schedule |
| sel | selected |
| SF | Suspense File (waiting or pending list) |
| spec'd | specified |
| stat | statistical |
| susp | suspense or suspense file |
| TRIMIS | Tri-Service Medical Information System. Refers to the system, the project/program, and the organization. |
| w/ | with |
| W/C | Wards and Clinics Subsystem |

wkld

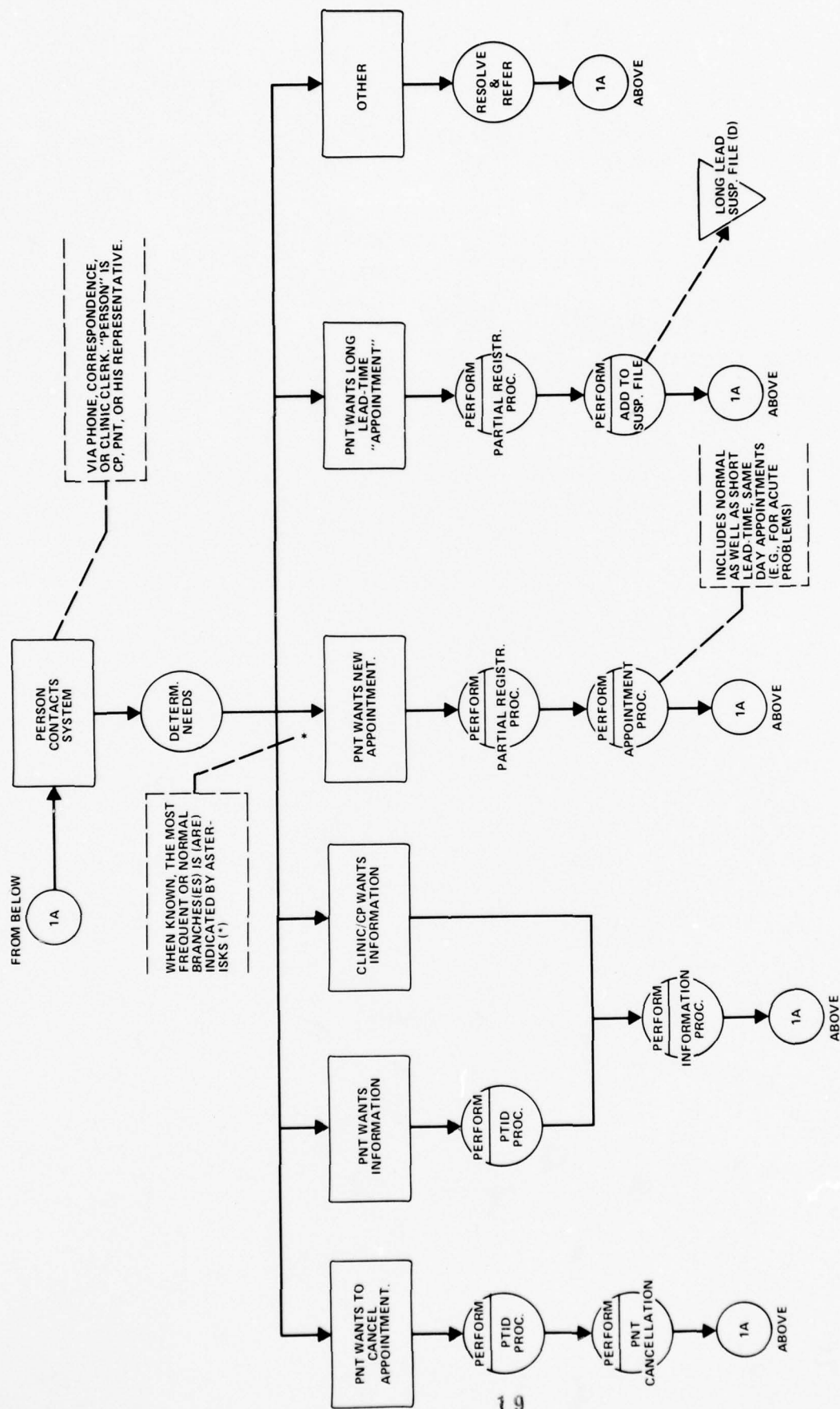
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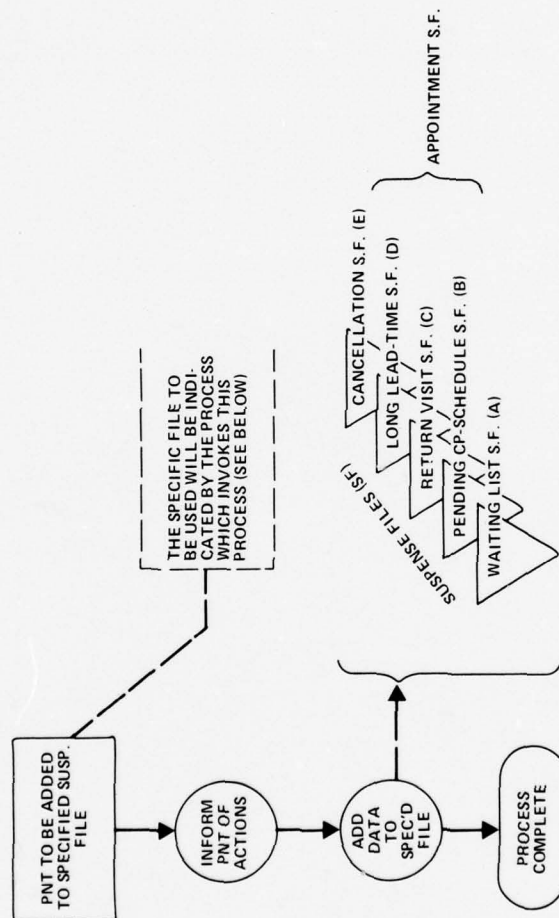
WRAMC

Walter Reed Army Medical Center

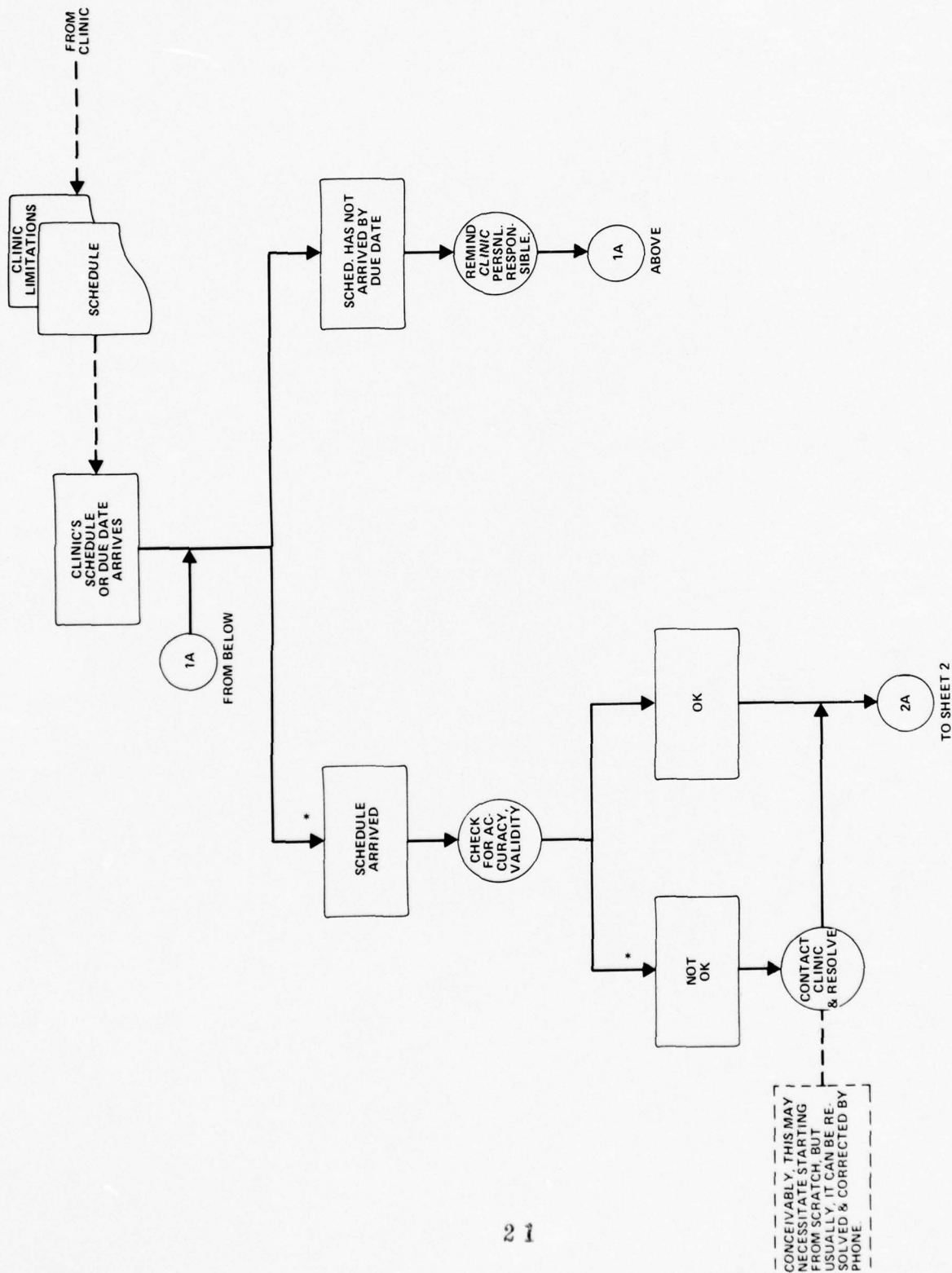


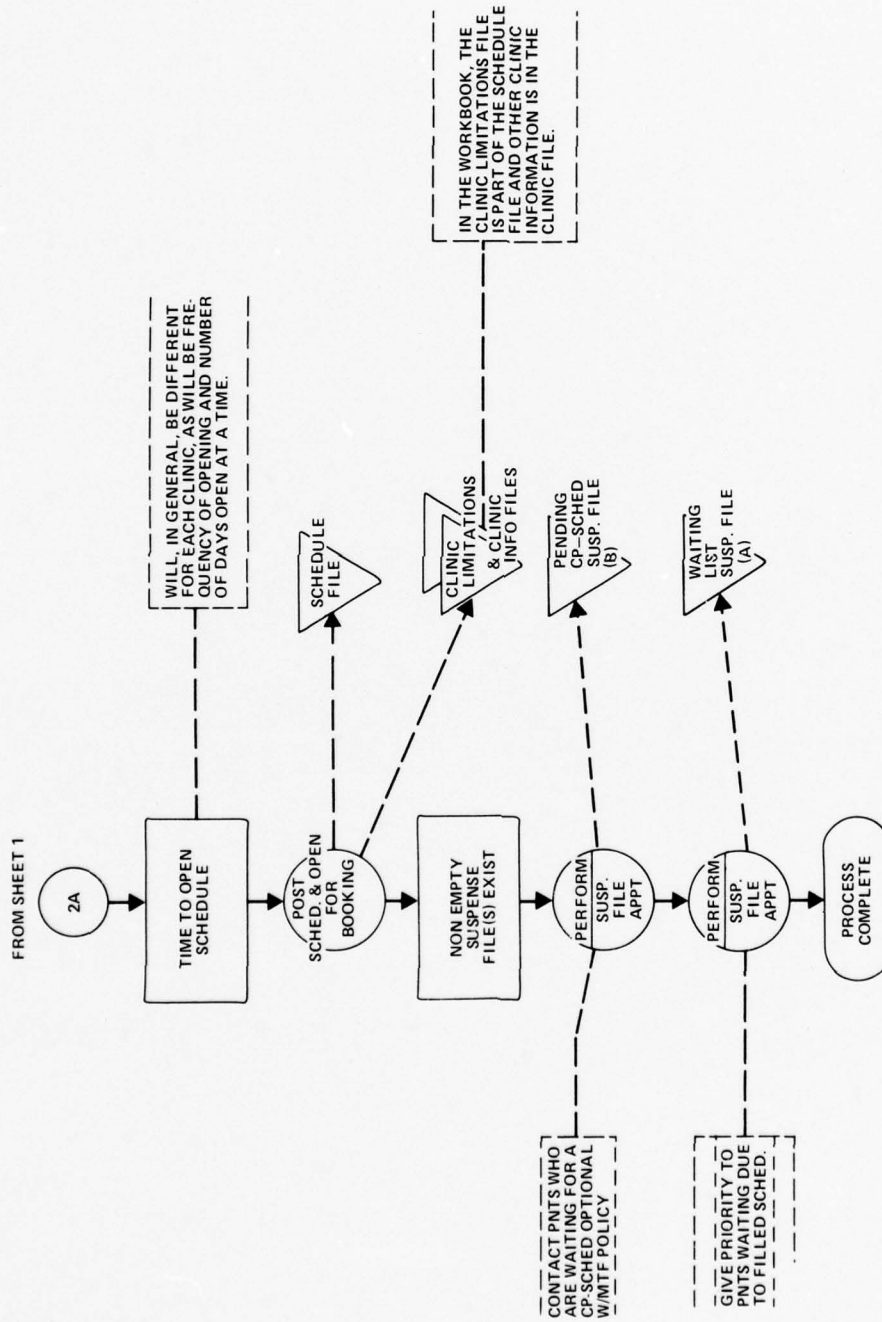
PAS PROCESS INVOCATION OVERVIEW

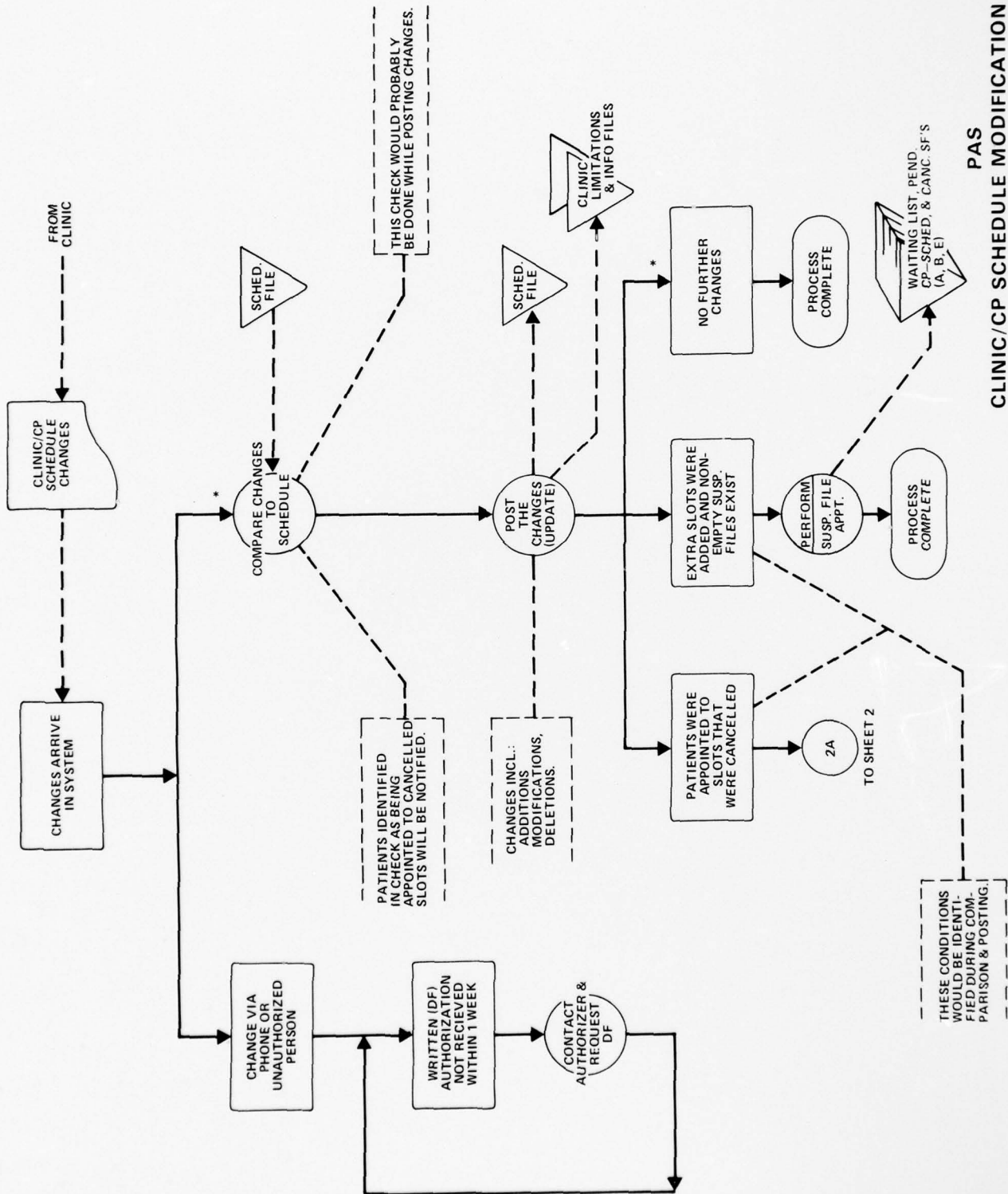




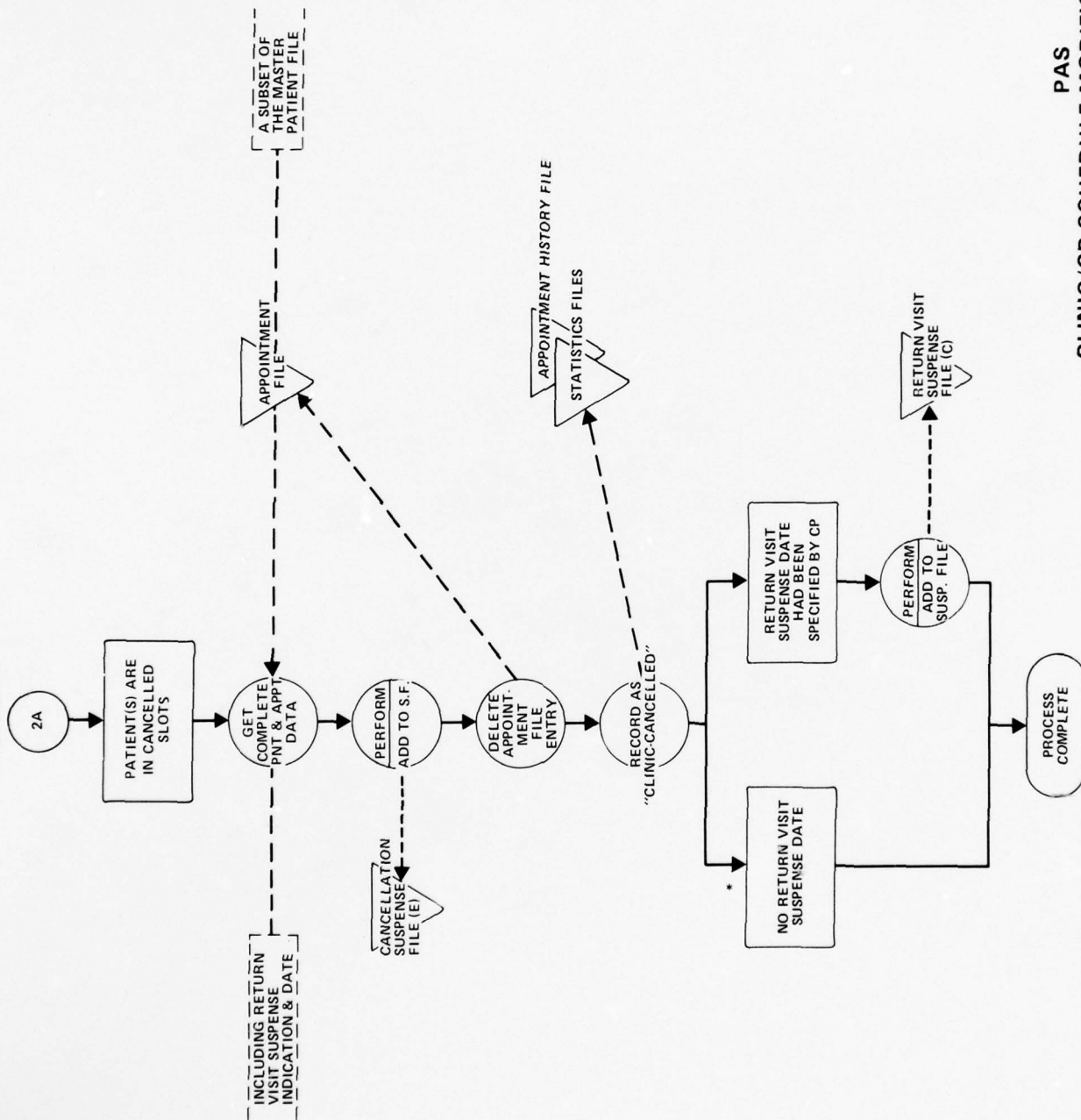
PAS
ADD TO SUSPENSE FILE PROCESS
SHEET 1 OF 1 3 NOV 75

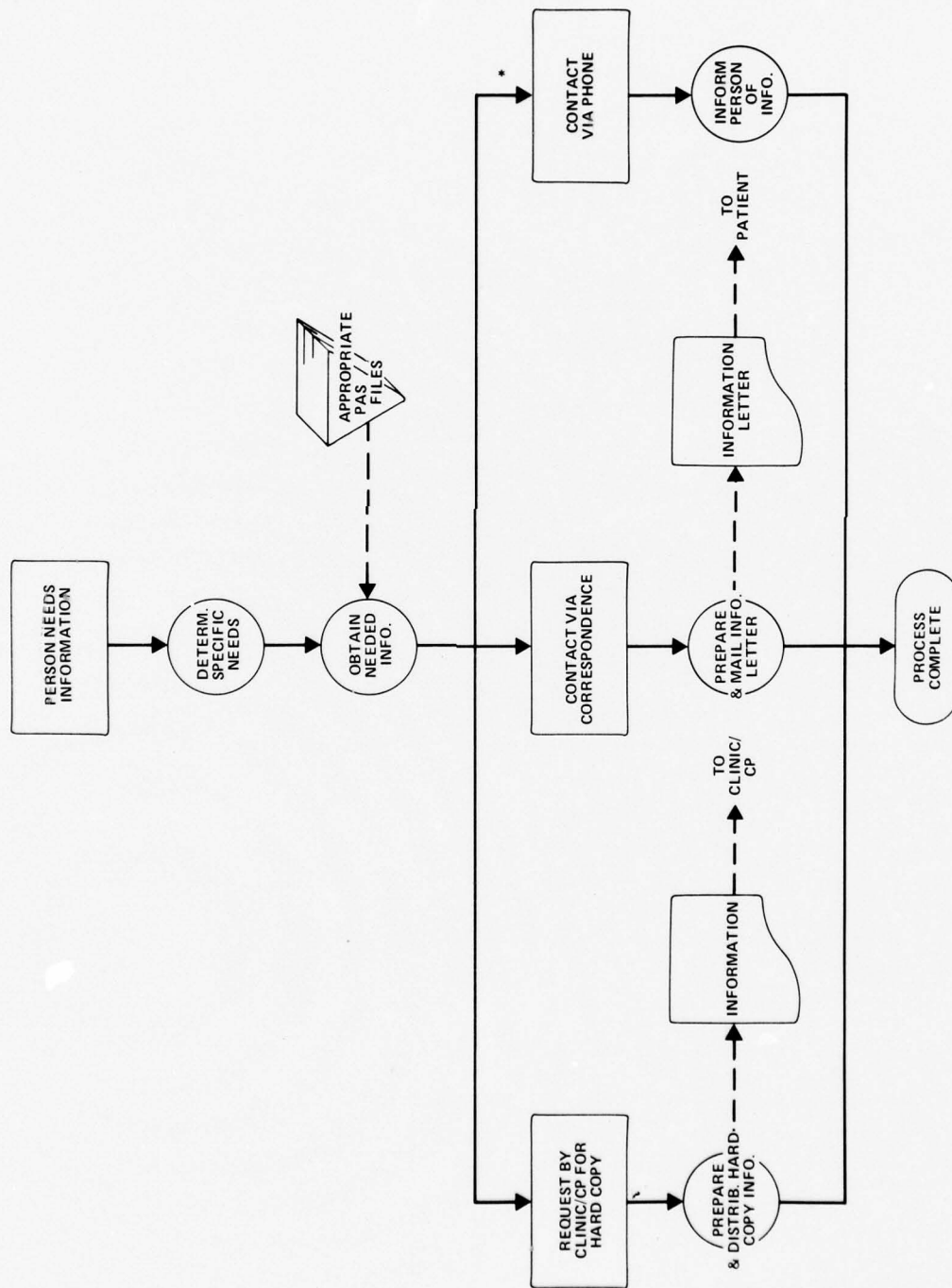






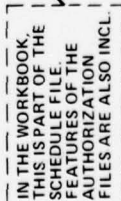
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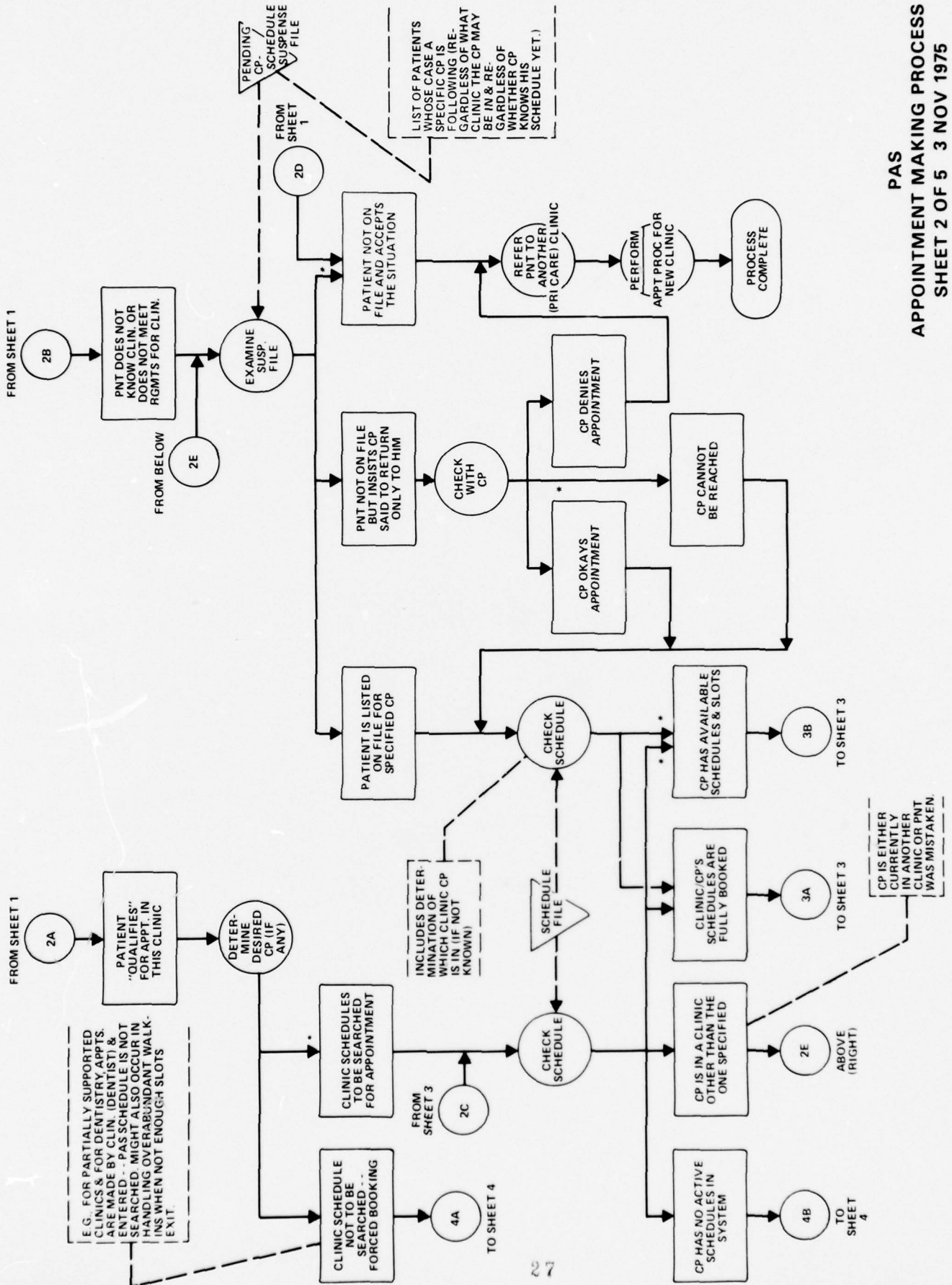


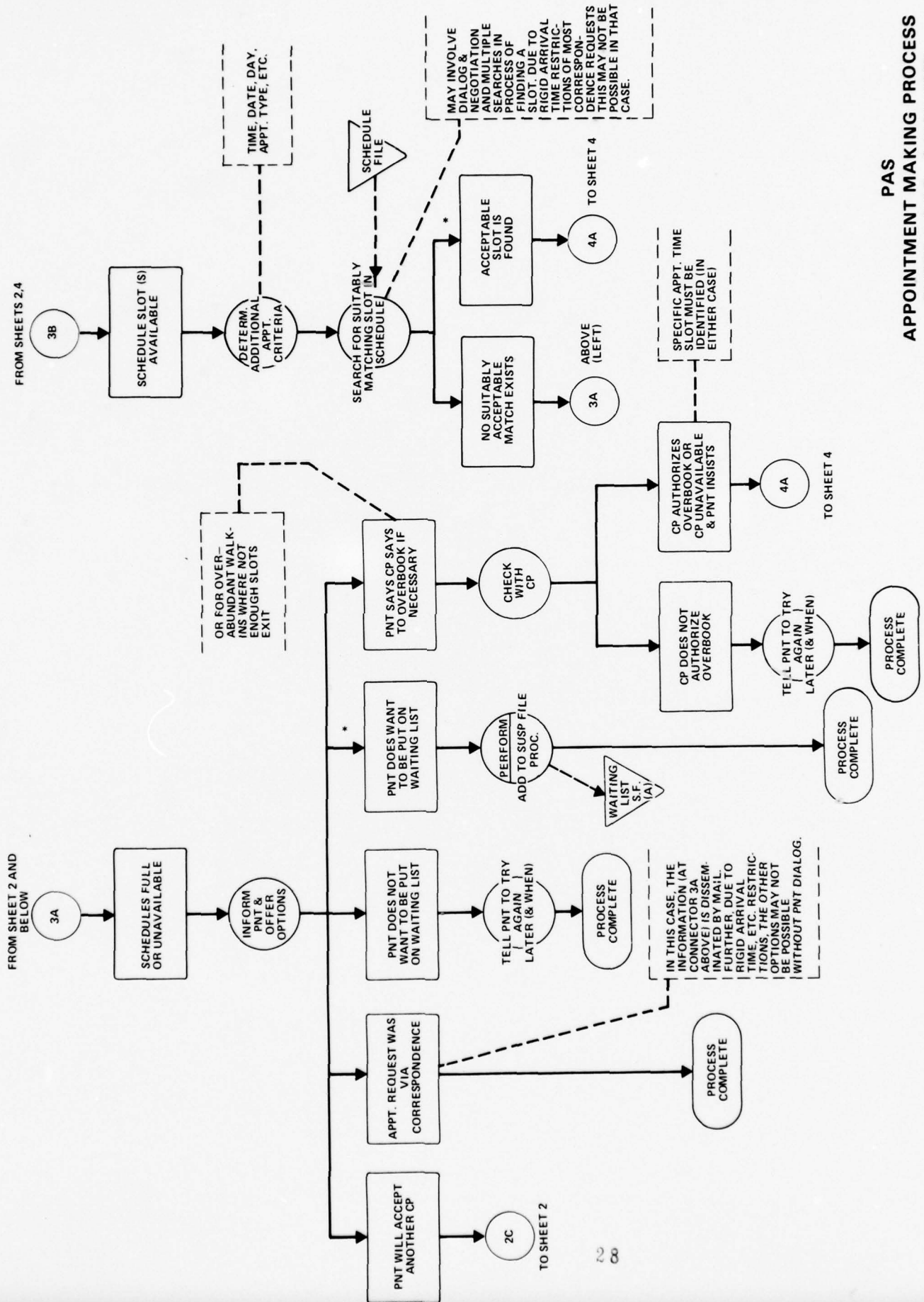


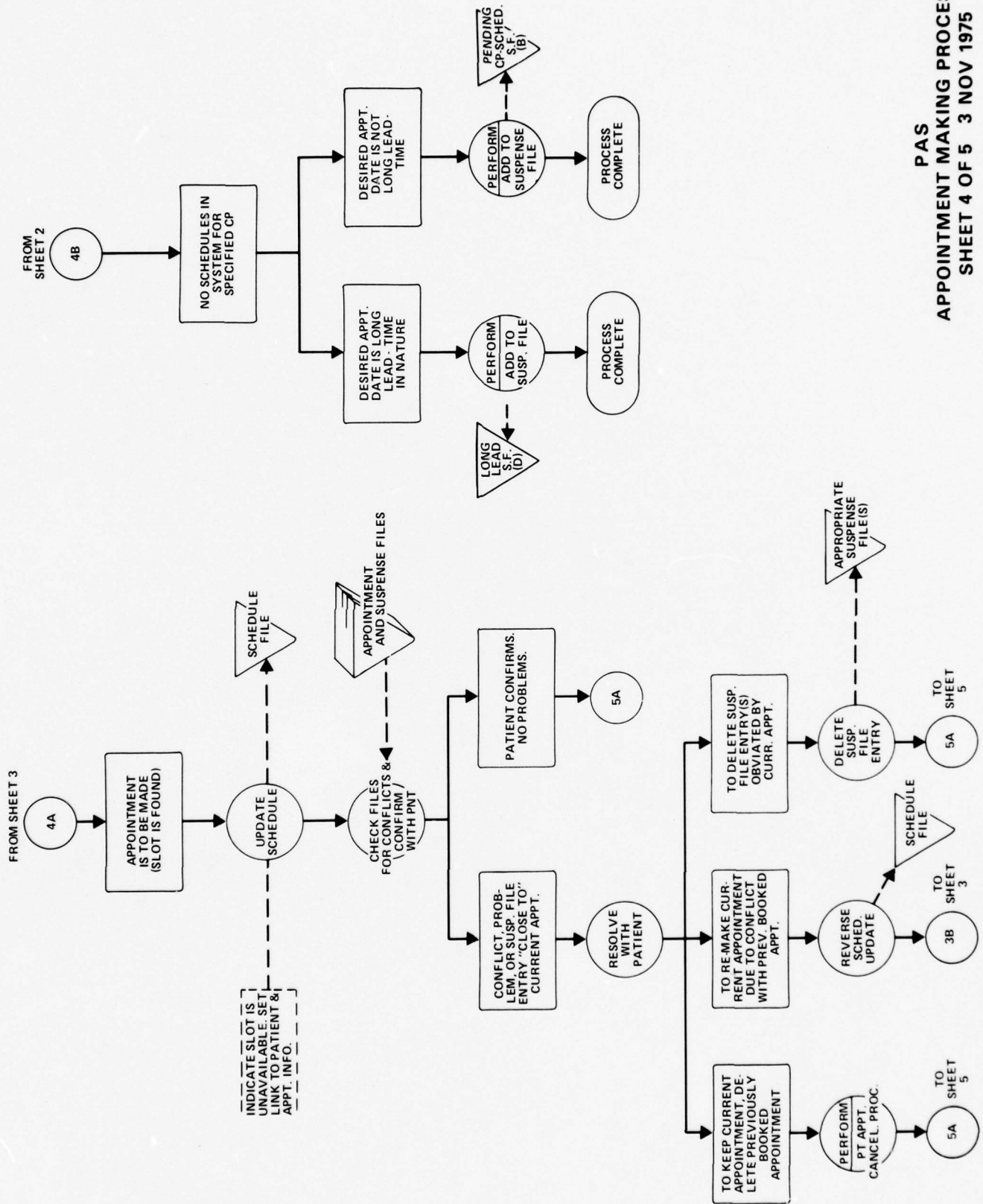
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 INFORMATION PROCESS
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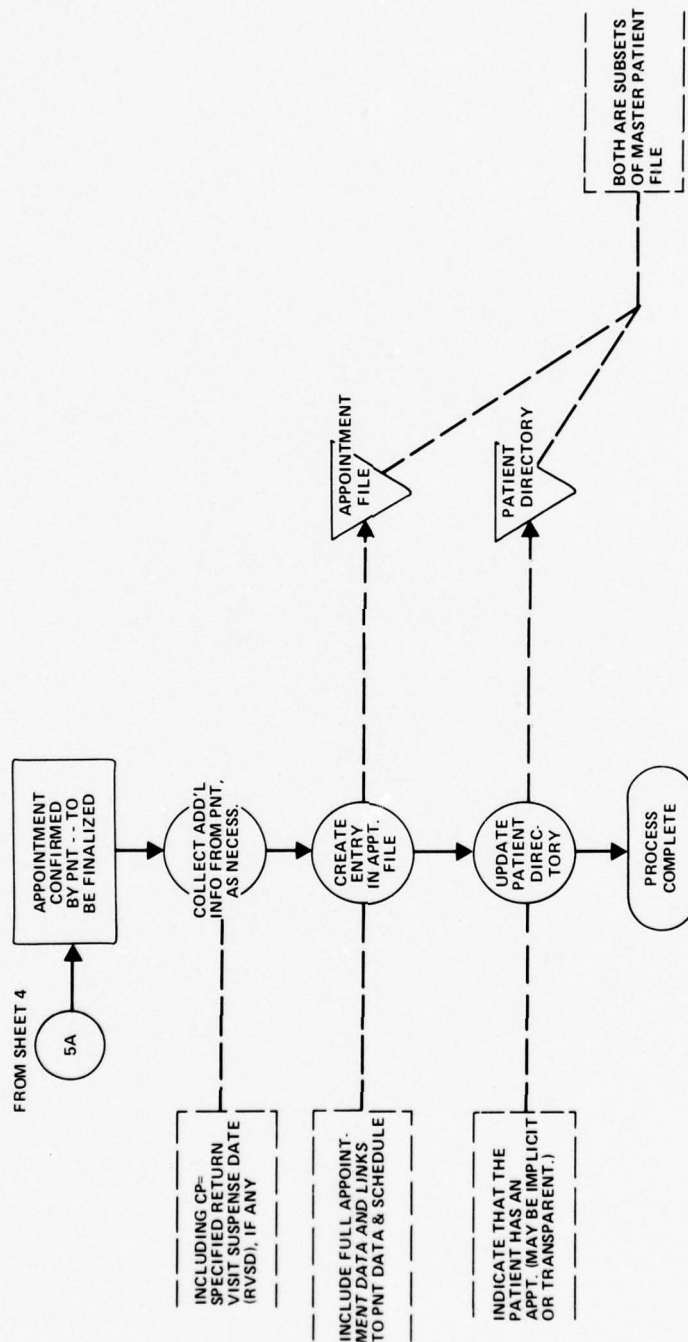
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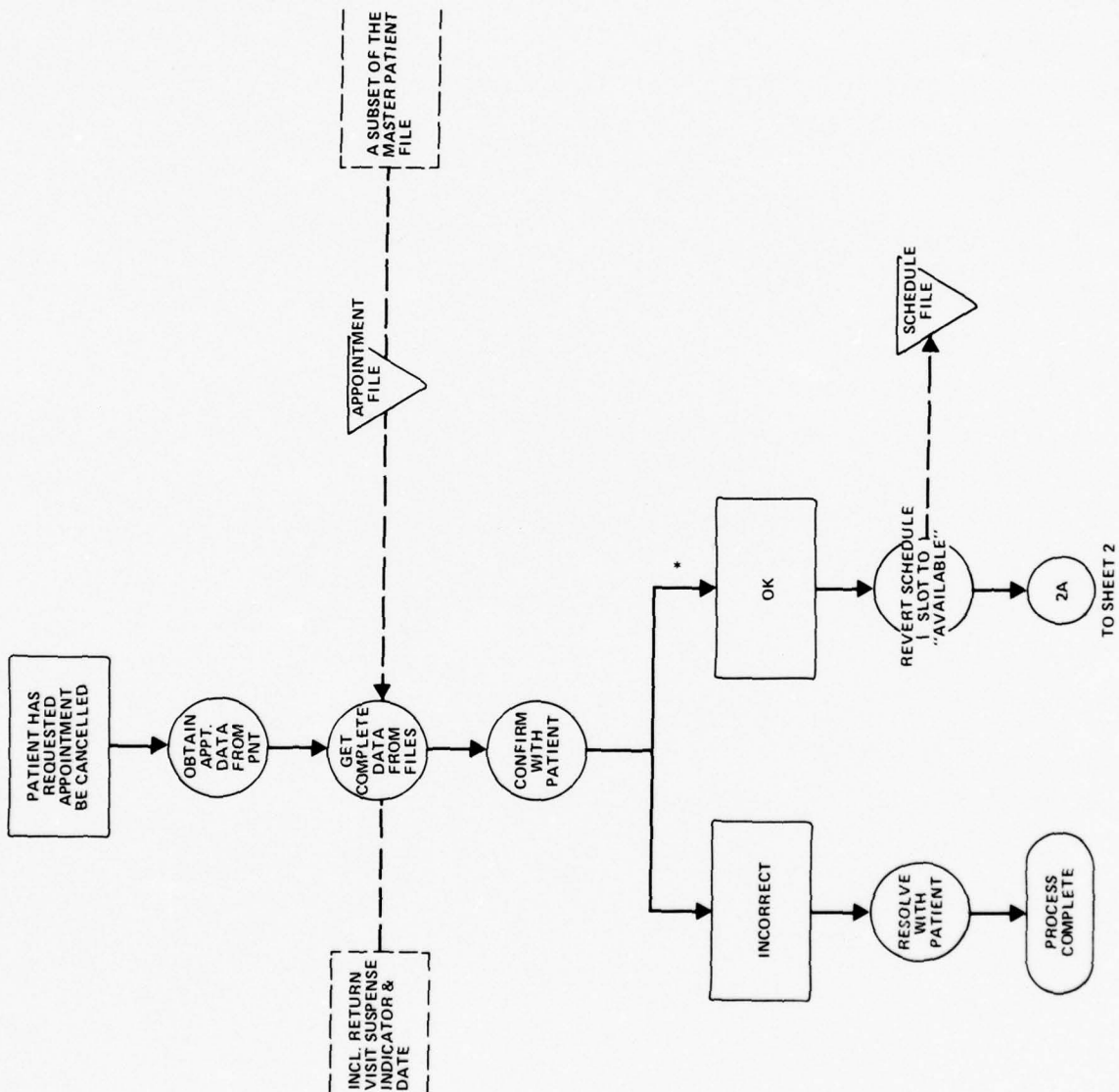






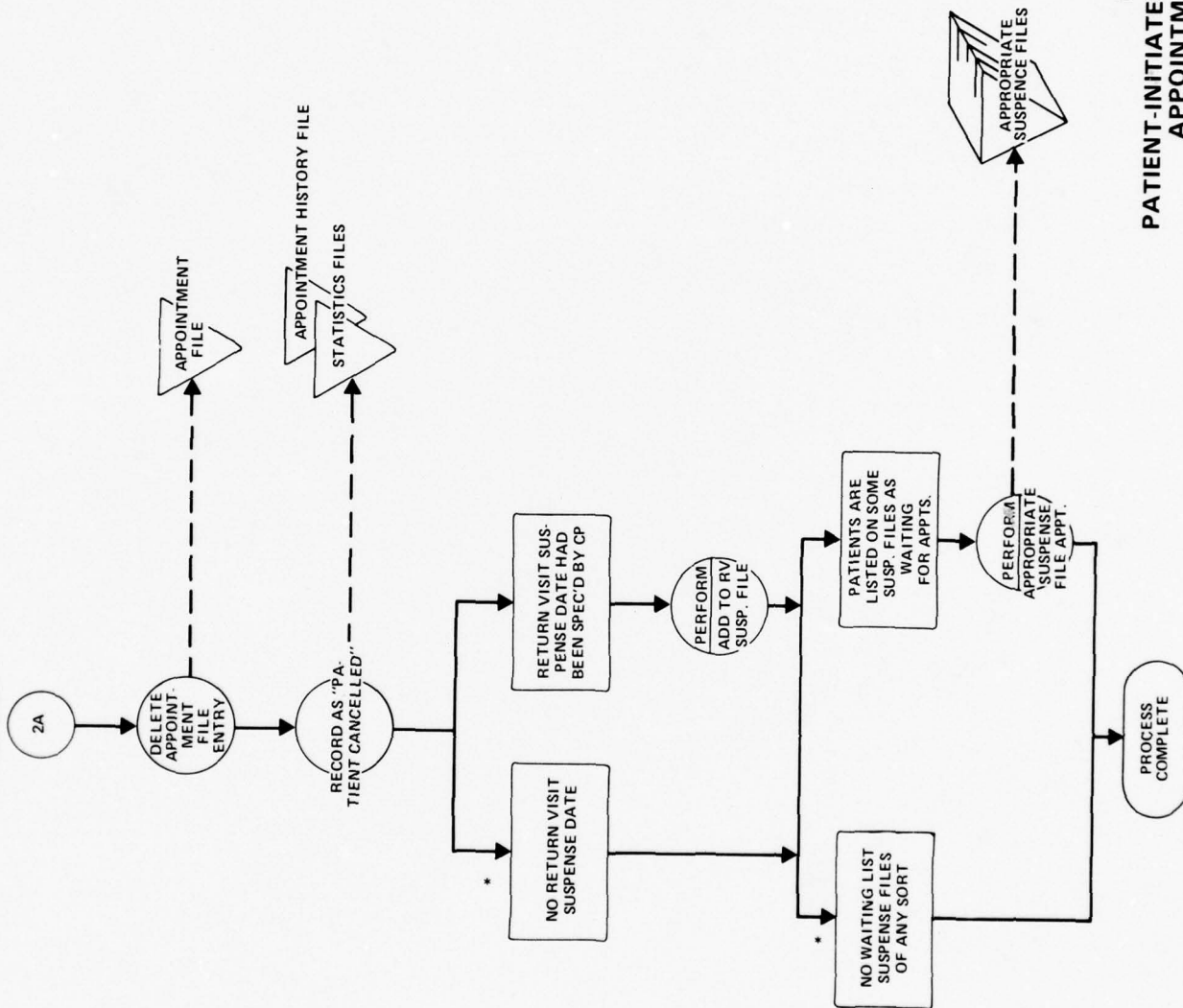


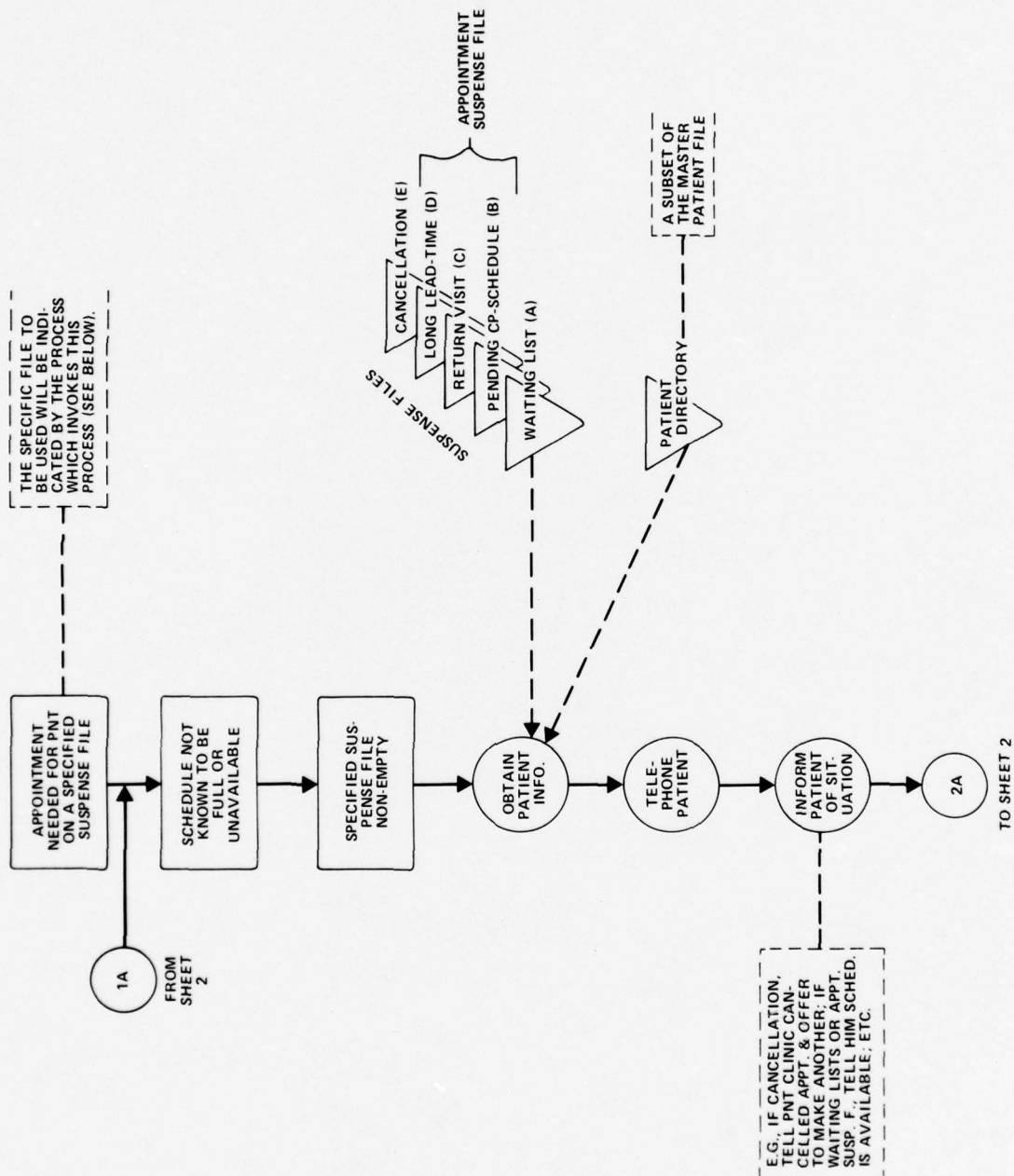
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APPOINTMENT MAKING PROCESS
SHEET 5 OF 5 3 NOV 1975

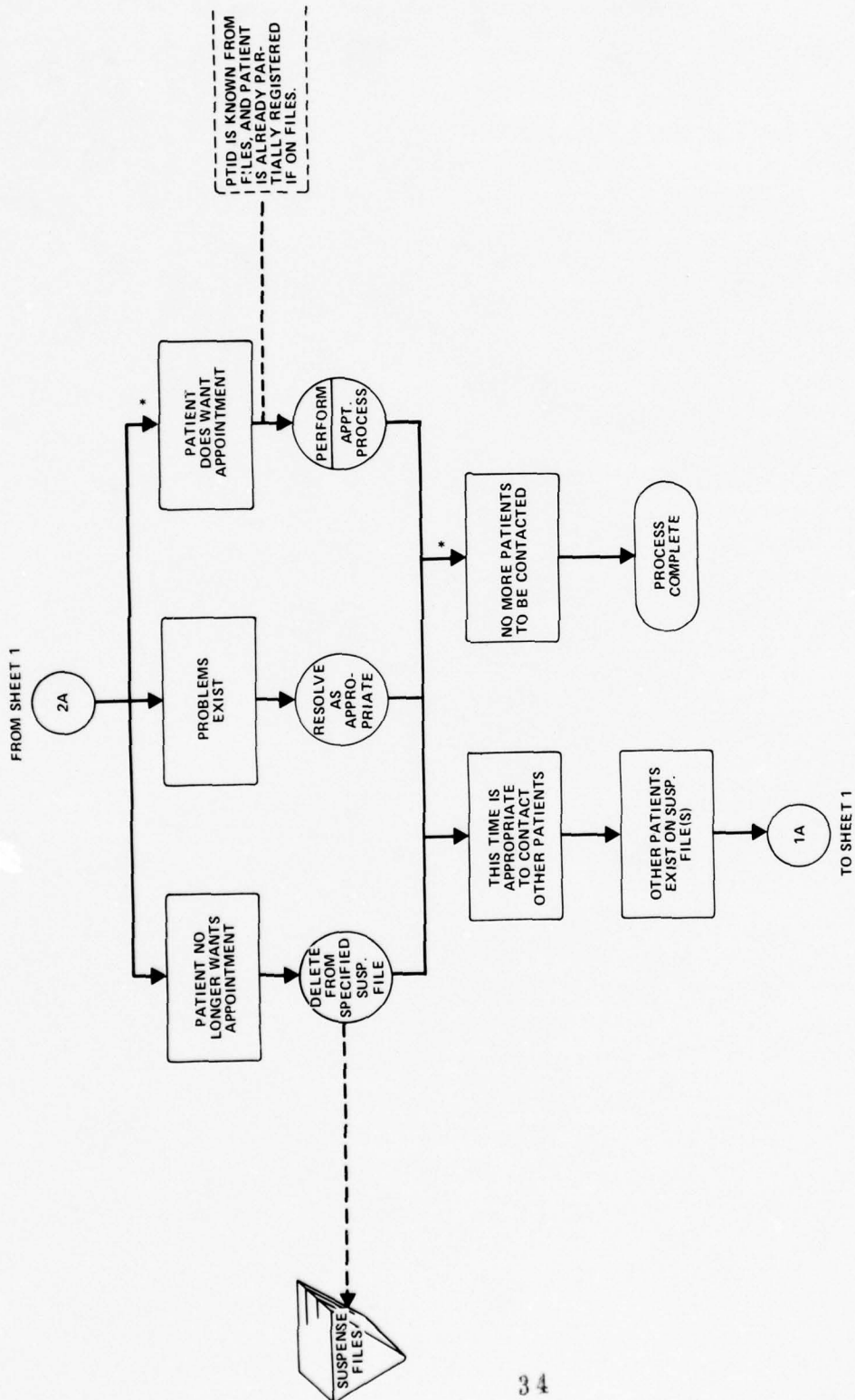


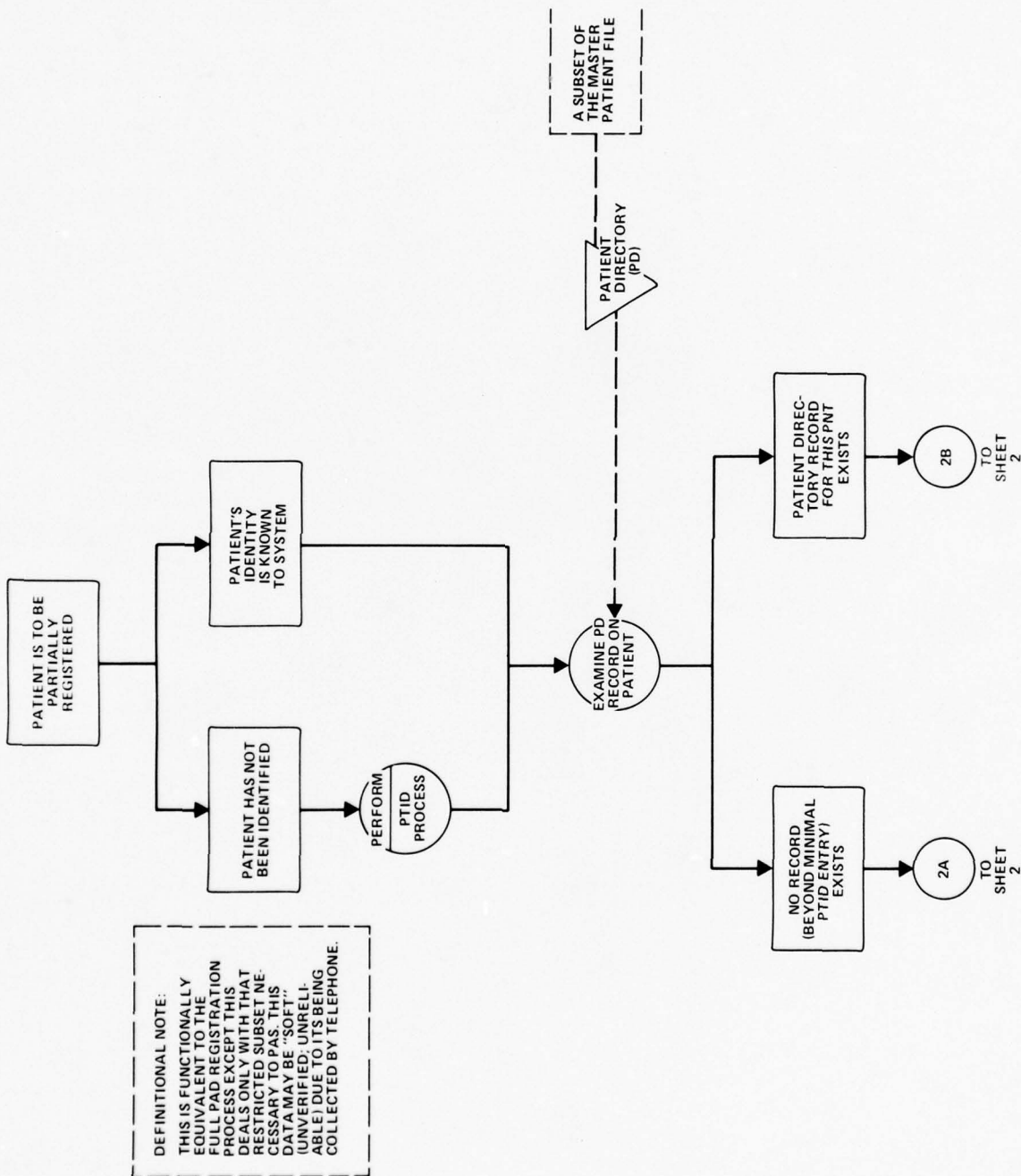
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 PATIENT-INITIATED CANCELLATION OF
 APPOINTMENT PROCESS
 SHEET 1 OF 2 3 NOV 1975

FROM SHEET 1

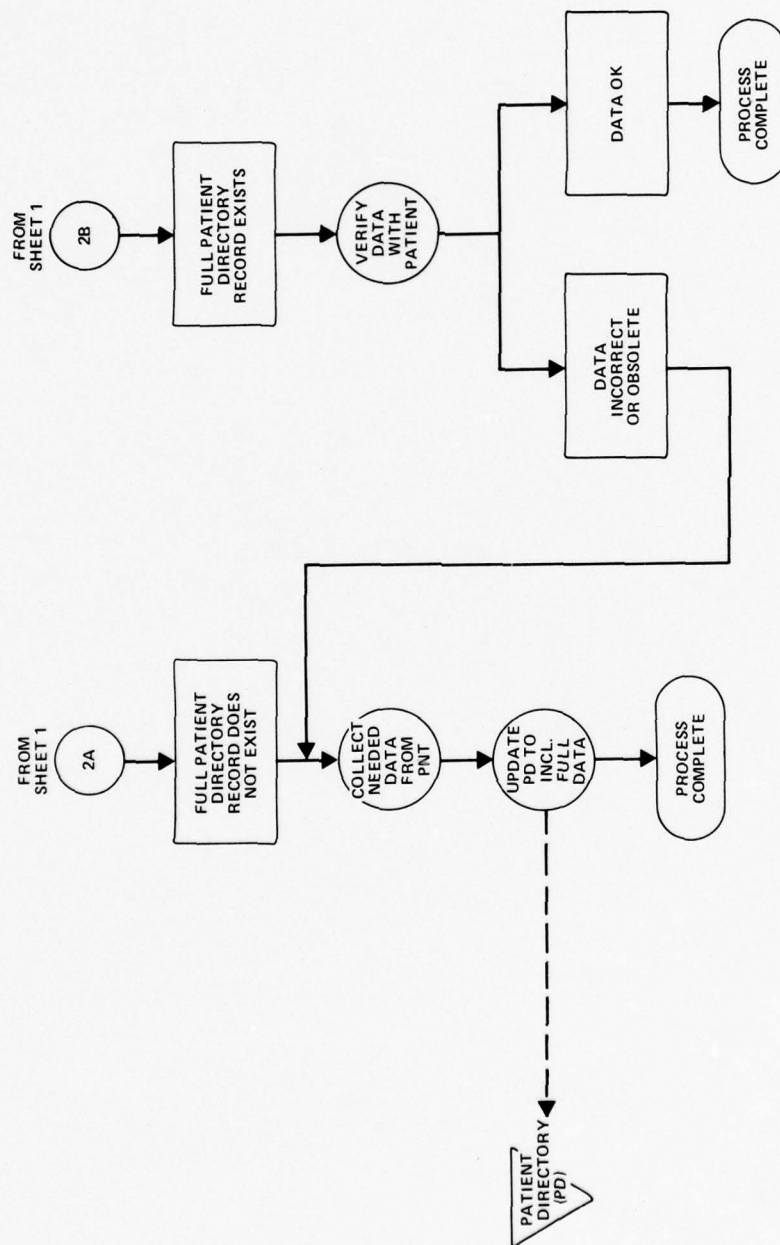




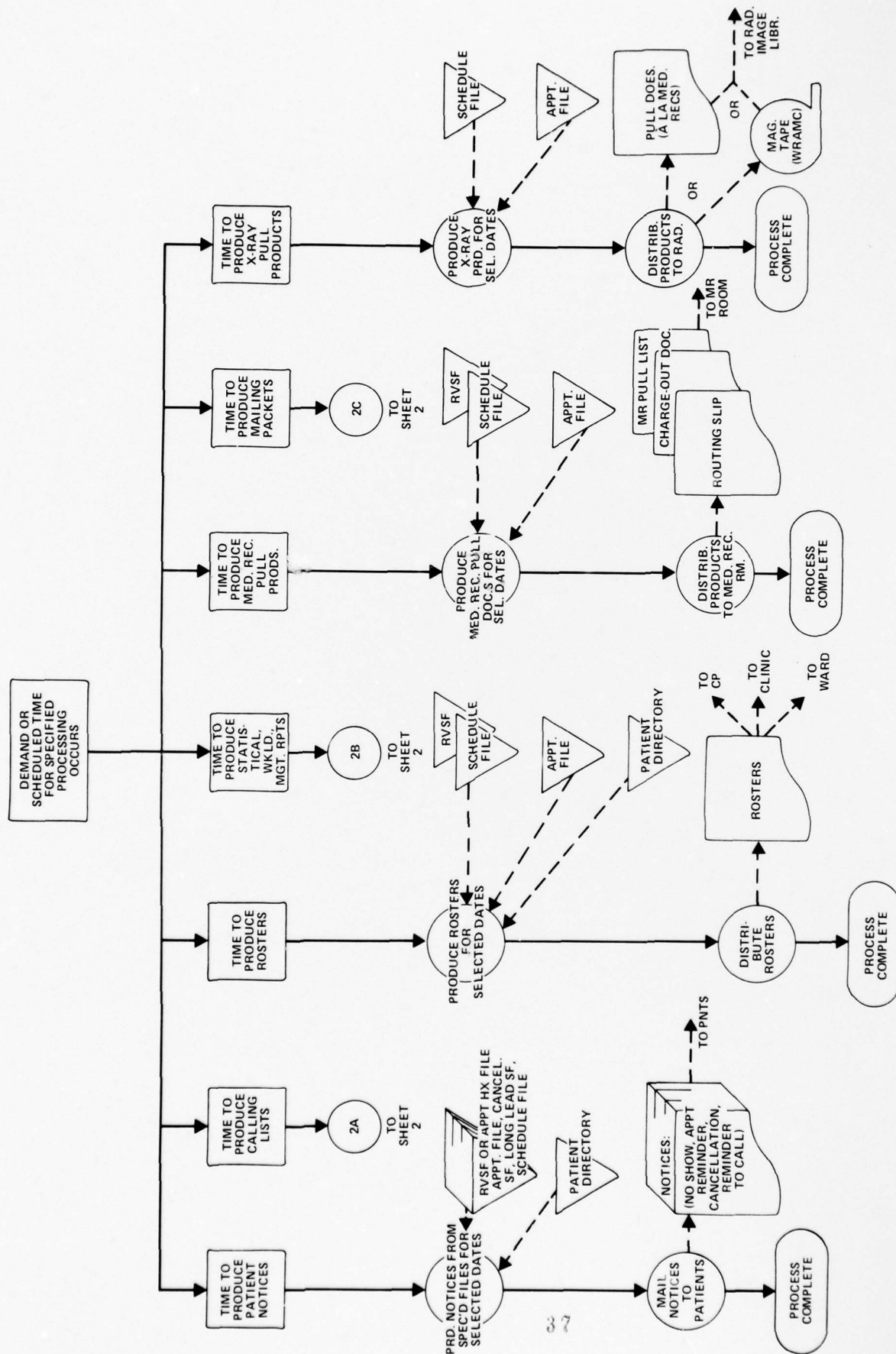


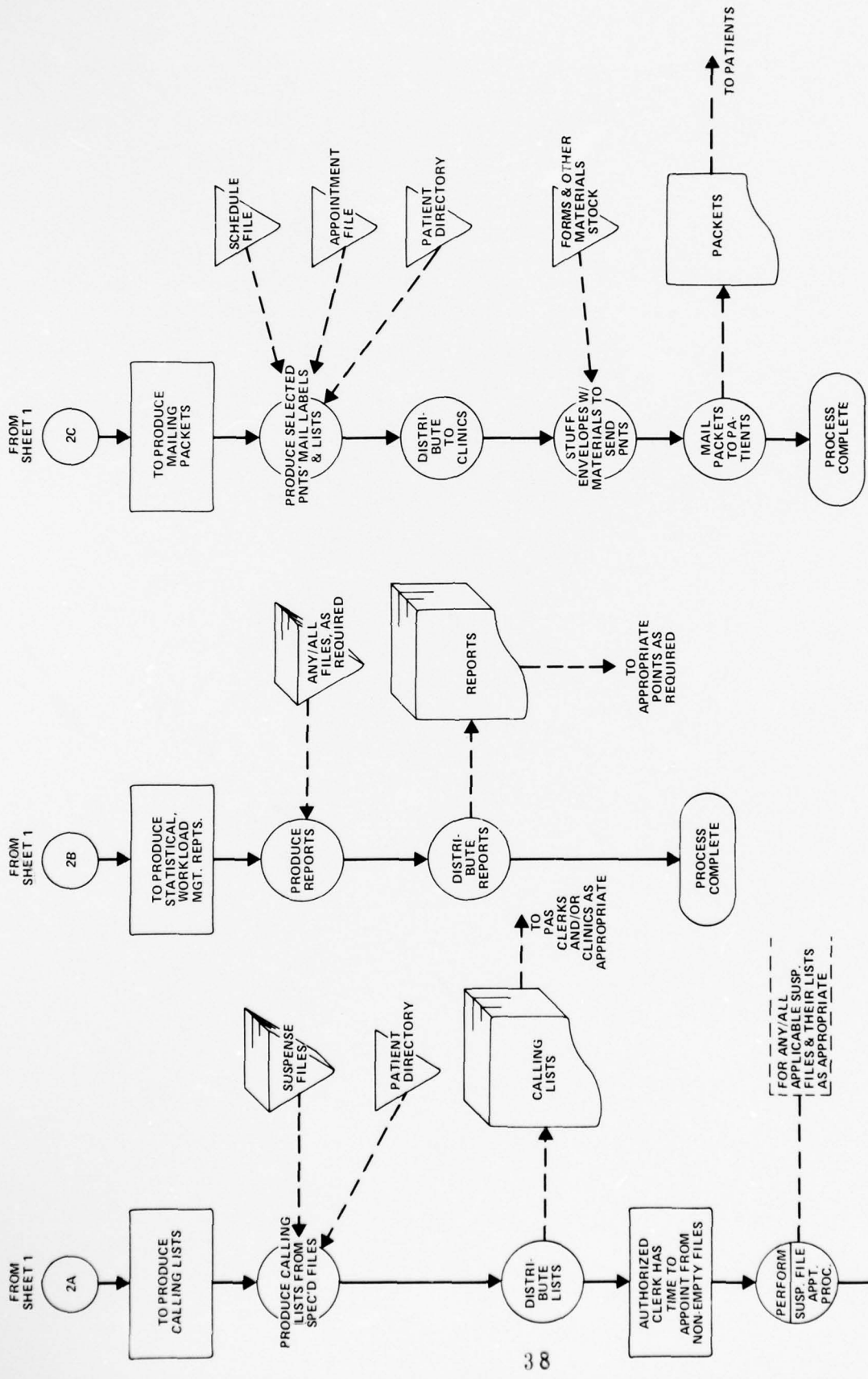


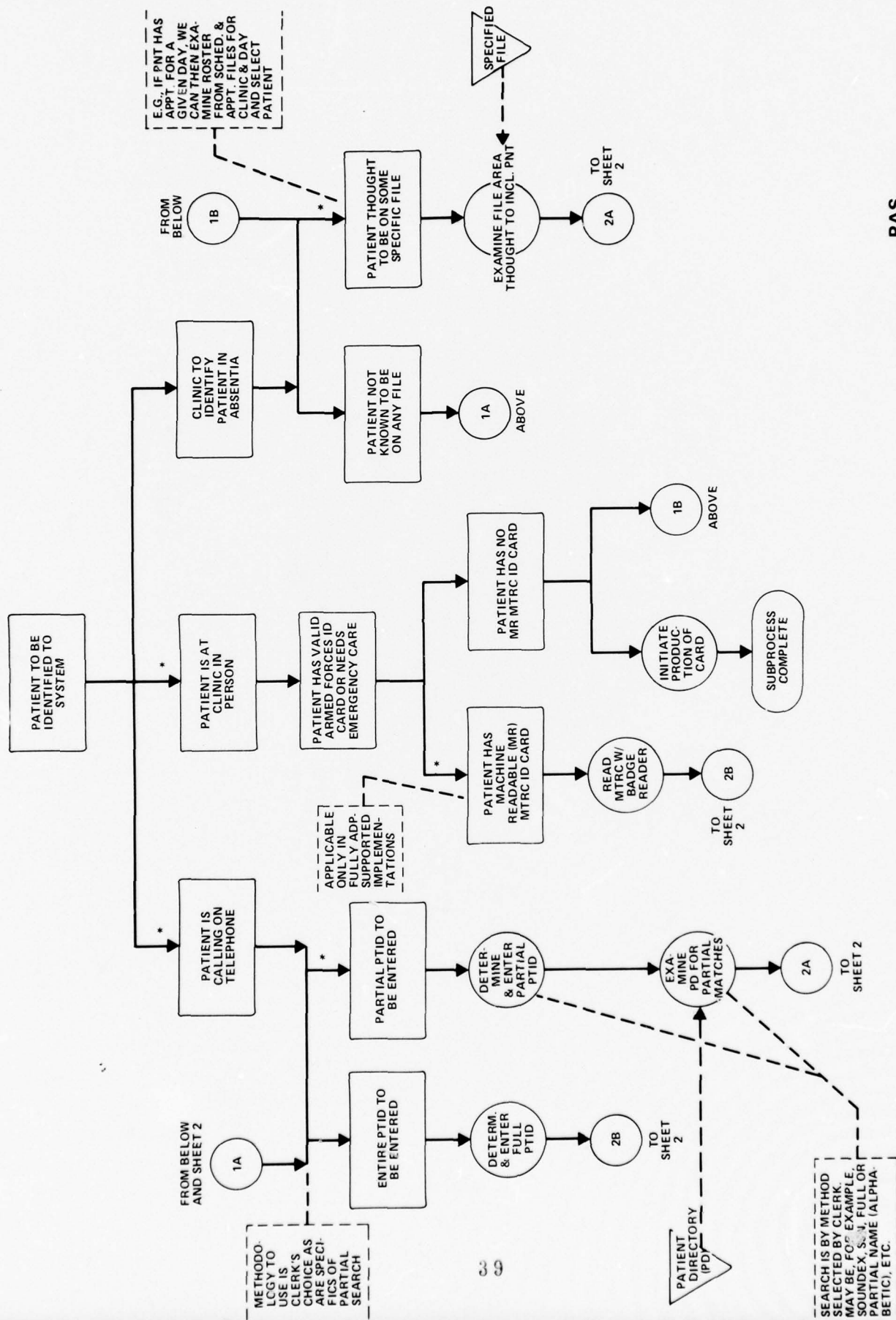
PAS
PARTIAL REGISTRATION PROCESS
SHEET 1 OF 2 3 NOV 1975

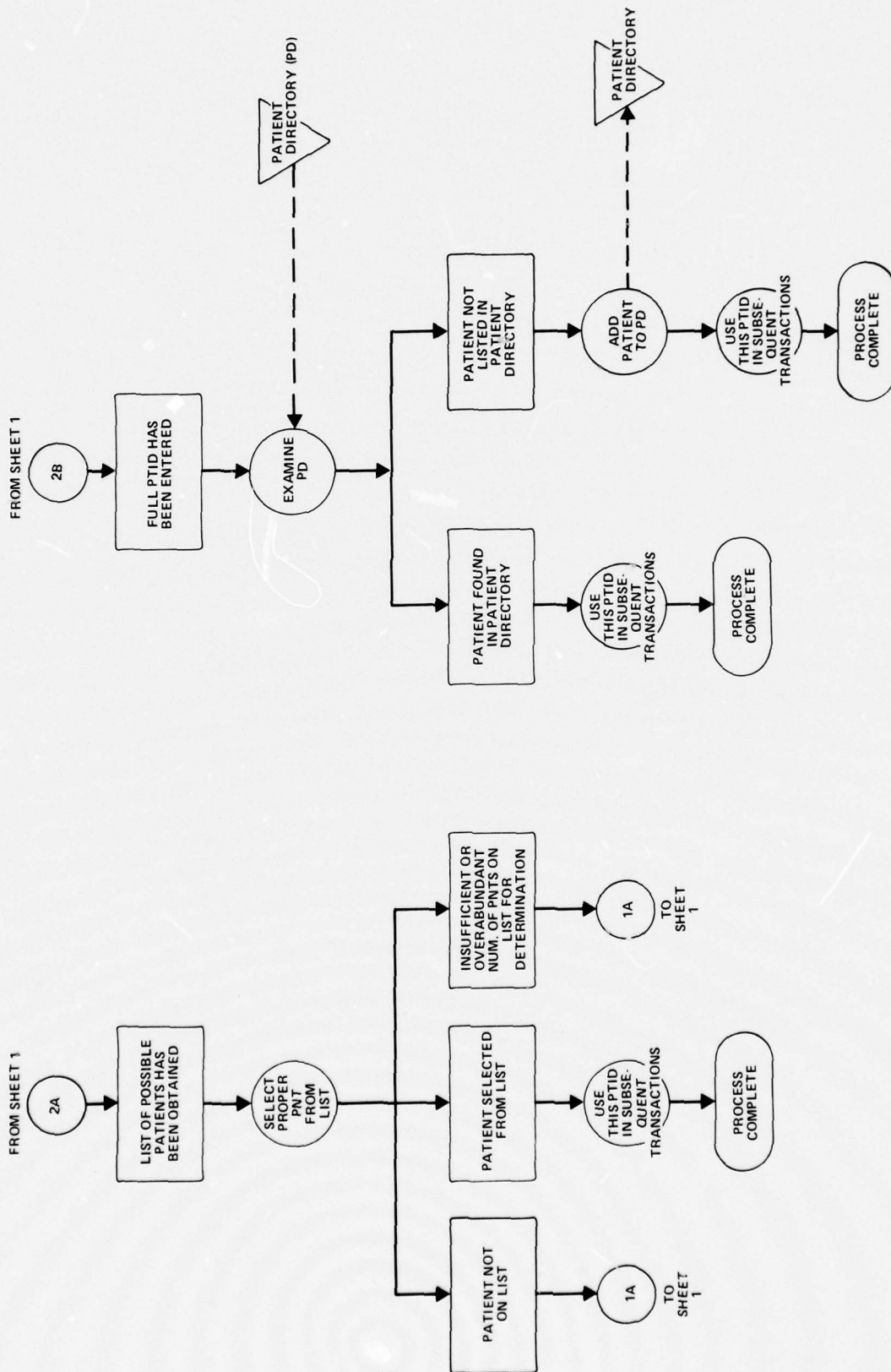


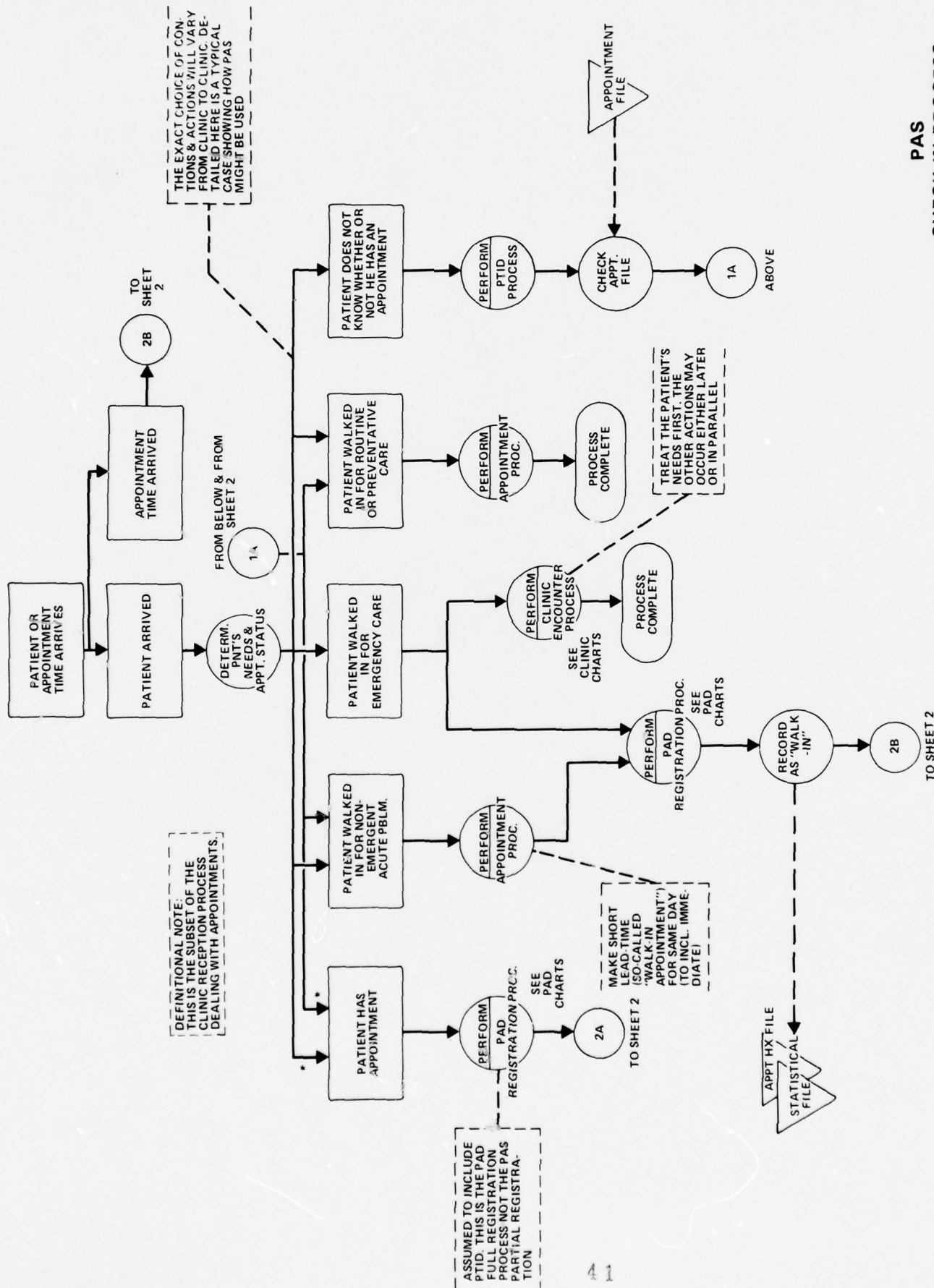
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 SHEET 2 OF 2 31 OCT 1975

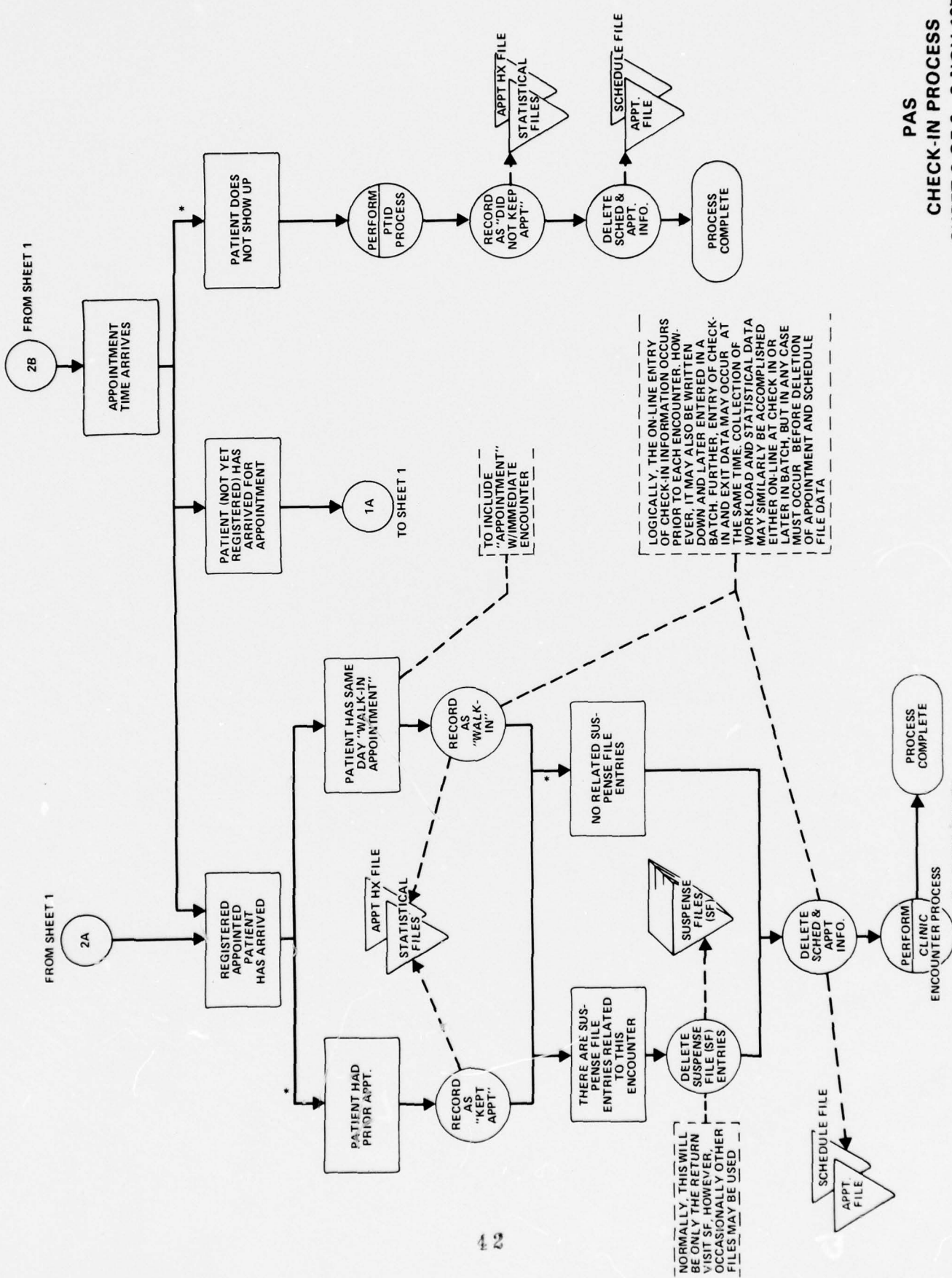




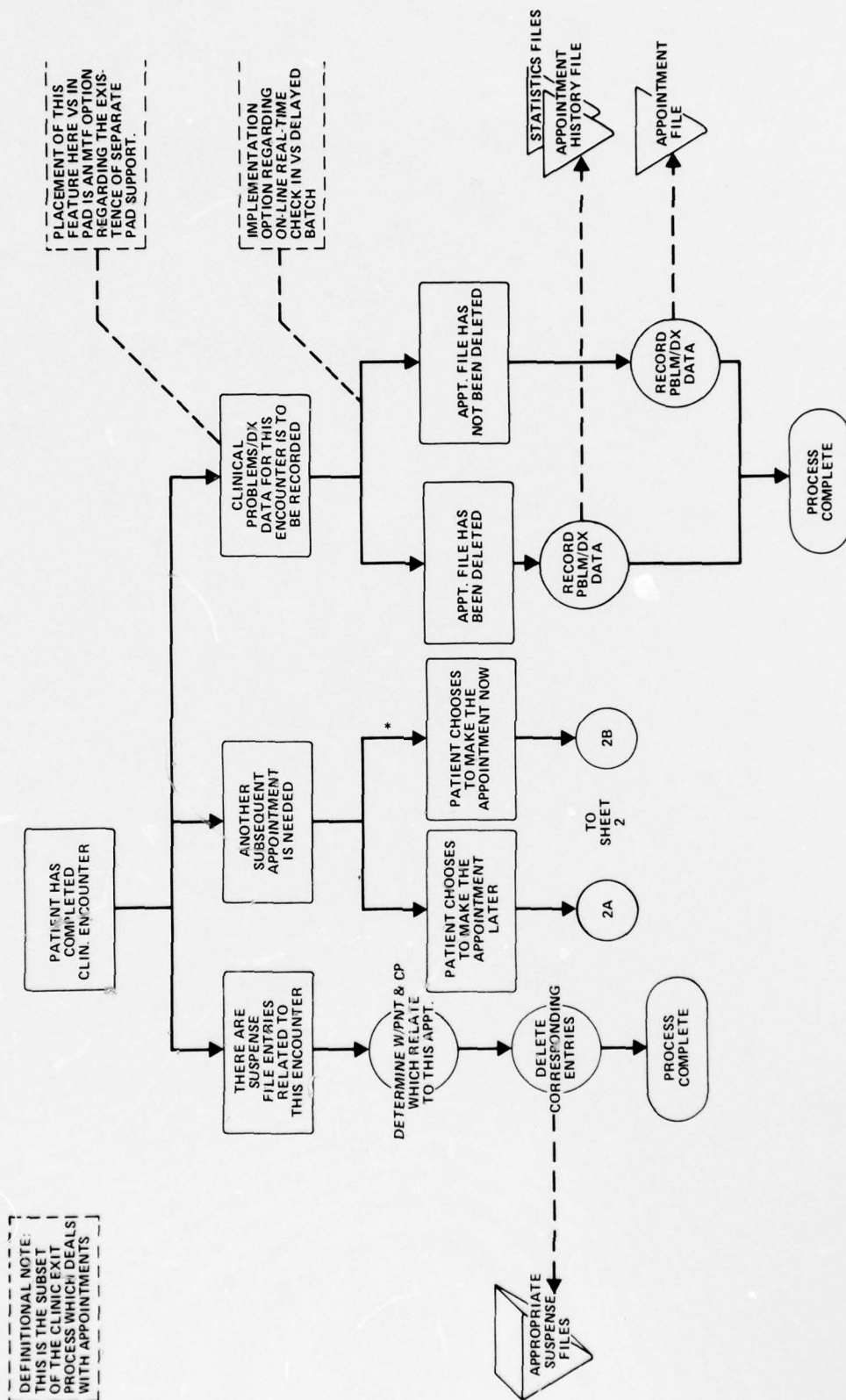


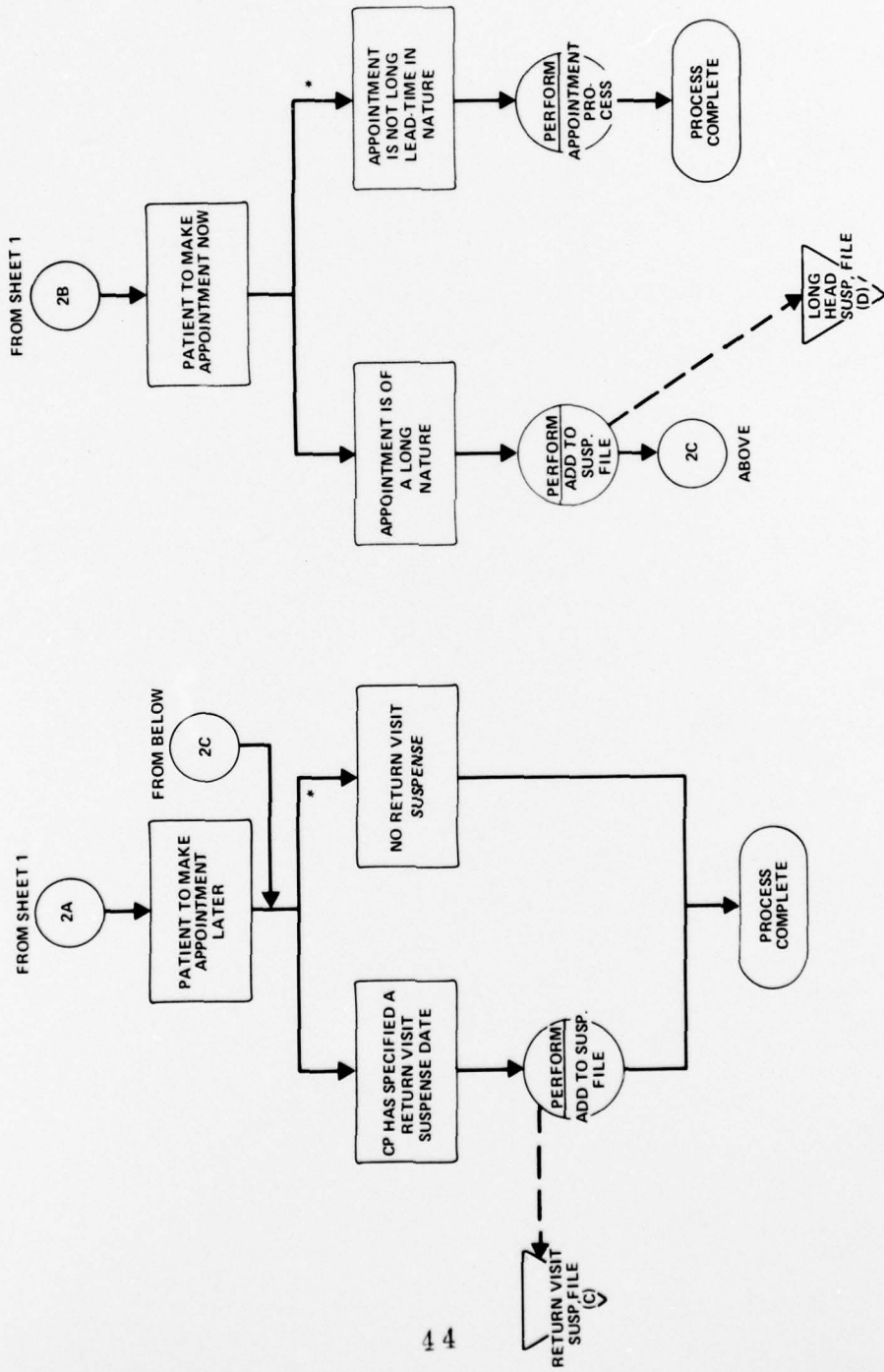






SEE CLINIC CHARTS





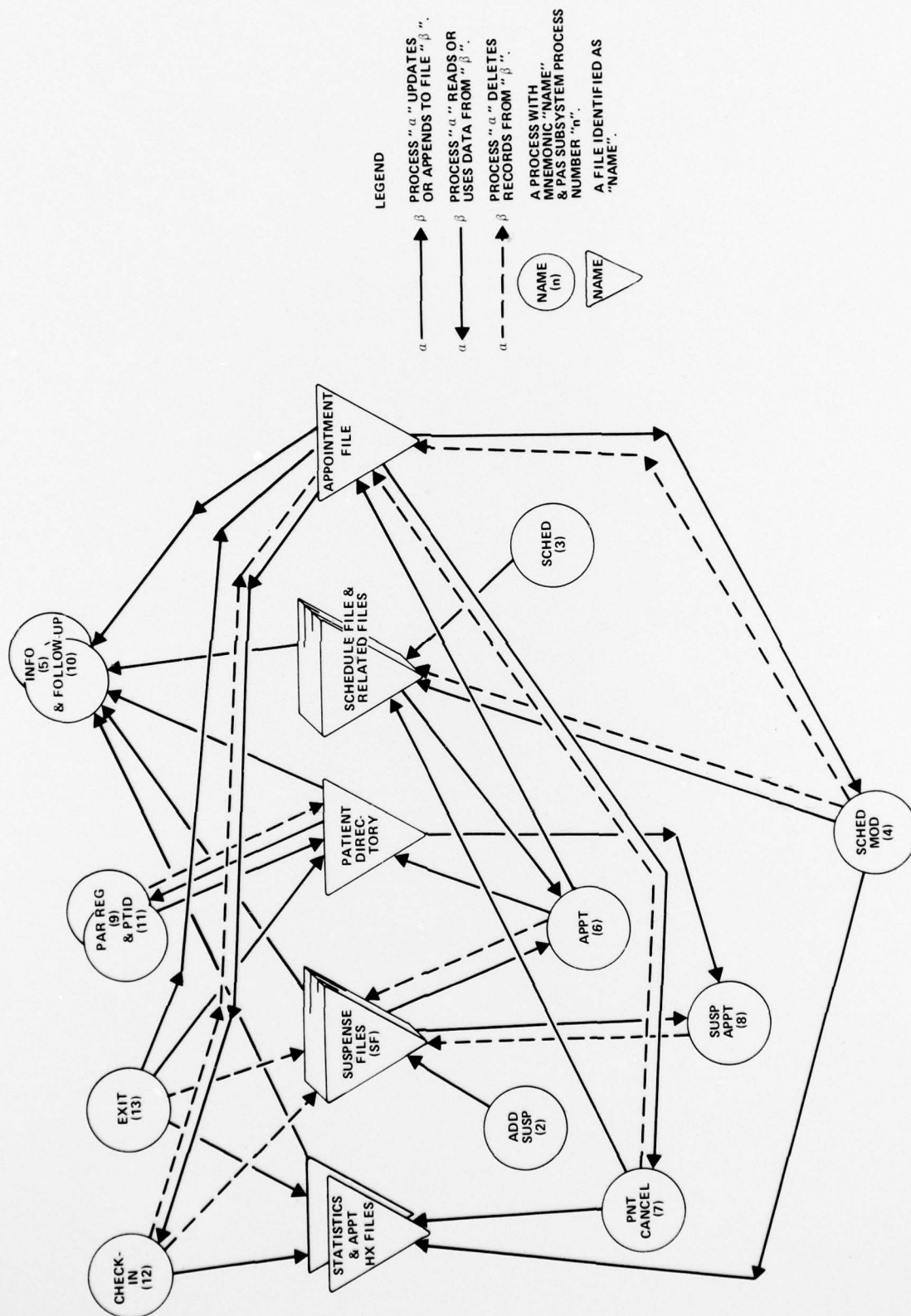
"FILE" DEPENDENCY SUMMARY

| PROCESS | FILES | Appt SF* | | | | | Master Pnt File | | | | |
|---------------|-------|--------------------|-----------------------|-------------------|----------------|--------------------|---------------------------------|---------------------|--------------------|---------------------|---------------------|
| | | - Waiting List SF* | - Pending CP Sched SF | - Return Visit SF | - Long Lead SF | - Cancellation SF* | - Schedule file & related files | - Patient Directory | - Appointment File | - Appt History File | - Statistical Files |
| 1. Contact | | | | | | | | | | | |
| 2. Add Susp | | A | A | A | A | A | | | | | |
| 3. Sched | | | | | | | A | | | | |
| 4. Sched Mod | | | | | | | AUD | | RD | A | A |
| 5. Info | | R | R | R | R | R | R | R | R | R | R |
| 6. Appt | | RD | RUD | RD | RD | RD | R | U | RA | | |
| 7. Pnt Cancel | | | | | RD | | U | | RD | A | A |
| 8. Susp Appt | | RD | RD | RD | RD | RD | | R | | | |
| 9. Par Reg | | | | | | | | AUR | | | |
| 10. Follow-Up | | R | R | R | R | R | R | R | R | R | R |
| 11. PTID | | (R) | (R) | (R) | (R) | (R) | (R) | RA | (R) | | |
| 12. Check-In | | D | D | D | (D) | (D) | D | | RD | A | A |
| 13. Exit | | D | D | D | (D) | (D) | | U | U | A | A |

LEGEND

| | | | |
|-----|--|---|--|
| R | Process reads or examines data in file | A | Process appends or inserts records into file |
| D | Process deletes records from file | U | Process updates or modifies existing records in file |
| () | Infrequent occurrence | | |

PAS FILE DEPENDENCIES



EXTERNAL INTERFACES SUMMARY

| Process | INTERFACE | | | | | | | | | |
|---------------|--------------------|------------------------|-----------------------|-----------------------|----------------------|--------------------|--------------------------|-----------------------|-------------------------|-------------------------|
| | - Hard Copy to Pnt | - Hard Copy to Clin/CP | - Hard Copy to Rec Rm | - Hard Copy From Clin | - Soft Info From Pnt | - Soft Info to Pnt | - Soft Info From Clin/CP | - (Soft) Info to Clin | - PAD Registration Proc | - Clinic Encounter Proc |
| 1. Contact | | | | | X | | X | | | |
| 2. Add Susp | X | | | | | X | | | | |
| 3. Sched | | | | X | | | | X | | |
| 4. Sched Mod | | | | X | | | X | X | | |
| 5. Info | X | X | | | X | X | X | X | | |
| 6. Appt | X | | | | X | X | X | | | |
| 7. Pnt Cancel | | | | | X | X | | | | |
| 8. Susp Appt | | | | | X | X | | | | |
| 9. Par Reg | | | | | X | X | | | | |
| 10. Follow-Up | X | X | X | | | | | | | |
| 11. PTID | | | | | X | | | | | |
| 12. Check-In | | | | | X | | | | X | X |
| 13. Exit | | | | | X | | X | | | X |

INDEX TO PAS CHARTS

| <u>Process</u> | <u>Mnemonic*</u> | <u>Process No.</u> | <u>No. Sheets</u> | <u>Page</u> |
|--|------------------|------------------------|-----------------------|-------------|
| Add to Suspense File | Add Susp | 2 | 1 | 20 |
| Appointment Making | Appt | 6 | 5 | 26 |
| Check-In (PAS Portion) | Check-in | 12 | 2 | 41 |
| Clinic/CP Scheduling | Sched | 3 | 2 | 21 |
| Clinic/CP Schedule Modification | Sched Mod | 4 | 2 | 23 |
| Clinic Exit (PAS Portion) | Exit | 13 | 2 | 43 |
| Follow-Up | Follow-up | 10 | 2 | 37 |
| Information | Info | 5 | 1 | 25 |
| Initial Contact | Contact | 1 | 1 | 19 |
| Partial Registration, PAS | Par Reg | 9 | 2 | 35 |
| Patient Identification | PTID | 11 | 2 | 39 |
| Patient-Initiated Cancellation of Appointment | Pnt Cancel | 7 | 2 | 31 |
| Suspense File Appointment | Susp Appt | 8 | 2 | 33 |

*These are not intended for use as general identifiers, but are only for use with these charts for indexing and cross-referencing purposes.

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